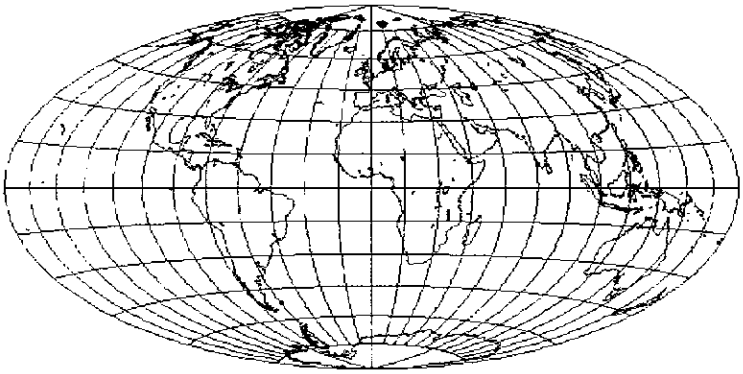
THE PAYMENT AND SETTLEMENT SYSTEMS IN THE SEACEN COUNTRIES

Volume II



Country Chapters

THE SOUTH EAST ASIAN CENTRAL BANKS
RESEARCH AND TRAINING CENTRE
KUALA LUMPUR, MALAYSIA

THE PAYMENT AND SETTLEMENT SYSTEMS IN THE SEACEN COUNTRIES

VOLUME II

Country Chapters

Edited by

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The South East Asian Central Banks
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THE PAYMENT AND SETTLEMENT SYSTEMS IN THE SEACEN COUNTRIES
Volume 1: Integrative Report of Country Experiences
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Visiting Research Economist and Project Leader

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FOREWORD

With the advent of globalisation and integration of markets, many central banks around the world are currently reviewing their payment and settlements systems with a view to enhancing the operational efficiency, reliability, speed, and timeliness of payment and settlement transactions. A well-functioning payment and settlement system promotes stability in the financial system, lowers transaction costs, aids in the efficient use of financial resources, helps the financial markets to become more liquid, and facilitates in the swift and smooth conduct of monetary policies.

In recent years, many SEACEN-member countries have already implemented or about to implement significant changes and reforms in their payment and settlement systems. The pressures behind this change were the liberalisation of financial transactions. At the same time, there had been a growing recognition of the need to minimise, if not completely eliminate, the significant risks inherent of the payment and settlement systems. Thus, modernising such systems had become inevitable for a more efficient and a less risky payment and settlement system.

Recognising the importance of safeguarding the stability and integrity of the payment and settlement systems, an in-depth study on this subject was deemed timely and useful for the SEACEN central banks in their quest for the best possible payment system.

This research project is a collaborative effort between the SEACEN member banks and the SEACEN Centre. Led by Dr. Magno. L. Torreja, Jr., Visiting Research Economist from Bangko Sentral ng Pilipinas (BSP), the Project Team comprises 10 country researchers, namely Mr. Iwan Setiawan (Bank Indonesia), Mr. Yu-Chul Kim (The Bank of Korea), Mr. Azzad Abdul Razak (Bank Negara Malaysia), Mr. Tsend-Ayush (The Bank of Mongolia), Mrs. Khin Thida Maw (Central Bank of Myanmar), Mr. Jagadishwor Prasad Adhikary (Nepal Rastra Bank), Mr. Jonathan Leow Chiun-Yi (Monetary Authority of Singapore), Mr. A. Kamalasiri (Central Bank of Sri Lanka), Mr. Kuo Hsing Chang (The Central Bank of China, Taipei) and Mrs. Toschanok Leelawankulsiri (Bank of Thailand).

The Project Report is divided into 2 volumes. The first volume, which contains regional analysis and integrative report of country experiences, was prepared by Dr. Torreja. The second volume presents the country chapters that offer more details of the payment and settlement systems in the individual countries as prepared by the respective country researcher.

The Project Report was completed with the kind assistance of several institutions and individuals. The SEACEN Centre wishes to acknowledge the valuable contributions of the payment and settlement systems department of all the member banks, for making available their staff to join the Project Team, and for their useful comments and suggestions on the first draft of the report. Special thanks are due to the Committee for the Payment and Settlement Systems (CPSS) of the BIS for their thoughtful comments offered during discussions on the findings of the Project at the *SEACEN-CPSS Seminar on Core Principles for Systemically Important Payment Systems (SIPS)* held in Bali Indonesia on 28-30 August 2001. In addition, the author of this Volume, wishes to especially thank the senior management of BSP and his supervisors and colleagues at the Treasury Department, BSP, for their support and assistance. He would also like to express his deep gratitude to management and staff of the SEACEN Centre, in particular Ms. Nurulhuda Mohd Hussain, Research Associate, for her research assistance throughout the project.

The views expressed in the report are those of the authors and do not necessarily reflect those of the member central banks, monetary authorities or the SEACEN Centre.

Dr. Subarjo Joyosumarto
Executive Director

Kuala Lumpur, Malaysia
August 2001

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Chapter 1

THE PAYMENT AND SETTLEMENT SYSTEMS IN INDONESIA

by

Iwan Setiawan

1. Introduction

1.1 Historical Background

In the early 20th century, de Javasche Bank, a bank owned by the government of the Netherlands East Indies supported the economic policies in the colony (now Indonesia). With respect to the payment system, De Javasche Bank, which was established in 1828, had the exclusive right to create and issue currency. Cash payment was common at that time whereas demand deposit payment was not known until 1 January 1907.

On 15 February 1909, an agreement was signed for the first clearing calculation in Jakarta (formerly Batavia). The clearing in Batavia was then followed by clearing calculation in other cities such as Surabaya and Semarang in 1909, Medan in 1915, Bandung in 1921 and Makasar in 1922.

A new chapter in Indonesian banking history began with the enactment of the 1953 Bank Indonesia Law, which took effect on 1 July 1953. This law marked the birth of Bank Indonesia as called for in the 1945 Constitution. Bank Indonesia's circular no. 2/115/Miscellaneous dated 16 December 1954 on central calculation deemed it necessary to develop a demand deposit payment system known locally as cheques, demand cheques or other commercial paper. The circular regulated matters concerning cheques, bank drafts, demand deposits, credit notes and other documents.

Pursuant to Law No. 13 of 1968 of The Central Bank, Bank Indonesia (BI) administered inter-bank clearing between banks within the same clearing area through one of the working units within Bank Indonesia. In cities where there is no Bank Indonesia office but with numerous commercial bank offices and a relatively high volume of clearing activity, administration of local clearing could be handed over to the government bank or to a regional development bank appointed by Bank Indonesia. In 1982, bank

BNI 1946 appointed to undertake clearing activity in Pekalongan, marking the first time that clearing was administered in a city with no Bank Indonesia office.

As the clearing system developed and the number of documents and participants increased, it became increasingly difficult to continue with manual clearing, particularly in Jakarta and other major cities. Automated Clearing System (paper-based) was implemented gradually on a limited basis beginning on 7 April 1990. Full implementation did not occur until 4 June 1990. The new system was known as the Jakarta Automated Clearing System (OKJ). In the next stage, from 6 January 1992, the automated system was also applied in Surabaya and was known as the Surabaya Automated Clearing System (OKS), while the Medan Automated Clearing (OKM) began on 11 January 1994, with the manual system being phased out.

In cities where the number of participants and clearing documents were still low, a Semi-Automated Local Clearing system (called SOKL) was used instead. In this SOKL, clearing document was still manually exchanged among the participants but clearing data records using computer and diskette to effect the inter-bank transaction. SOKL was first applied in the Jambi office of Bank Indonesia, followed by the clearing operators in the Bank Indonesia offices (KBI) and non-bank Indonesia offices. As of the year 2001, SOKL has been used in 35 KBI and 16 non-KBI.

In 1995, BI developed and began to implement an Automated and Integrated Inter-Office Fund Transfer System (SAKTI) which provides facilities to conduct bank inter-office transactions based on bank's account held in Bank Indonesia office with electronic data transmission using VSAT and frame relay facilities.

The rapid increase of clearing activities in the nation required a speedier, more accurate and safe clearing system. On 18 September 1998, Bank Indonesia established the Jakarta Electronic Clearing System (called SKEJ). SKEJ in an on-line system, which transmits the clearing document information using computer and electronic communication.

On 20 August 1999, BI officially installed an electronic transfer system between the Bank Indonesia's Electronic Information and Transaction Service (BI-LINE) to minimise the risks of the payment system. BI-LINE is an electronic fund transfer system which enables transfer of funds in a real time basis from banks to each bank's account at the central bank, to

other banks or to a government account via Bank Indonesia and replaced submission of BI demand deposit documents from banks to Bank BI office (Bank Indonesia's Bilyet Giro). This system was developed and limited only to banks in Jakarta as an interim solution before BI implemented RTGS. Since the implementation of Bank Indonesia Real Time Gross Settlement (BI-RTGS) was implemented on 17 November 2000 in Jakarta, operations of BI-LINE system only limited to non-bank financial institutions or specific government offices, such as the Directorate General of Taxation. Recently, the BI-RTGS was also implemented in Bandung on 1 June 2001, and Surabaya on 6 July 2001 and gradually will be implemented in other Bank Indonesia offices across the nation.

1.2 Methods of Making Payment and Settlements

The majority of the general population in Indonesia still prefers to pay in cash for purposes of making daily payments for goods and services, even for higher value transactions especially in small town or other remote areas. Cheque and Bilyet Giro[1] usage is largely restricted to companies or wealthier individuals. A wide range of end-user payment services characterising the developed economies is beginning to emerge: full on-line banking systems and networks, electronic direct credit/debit services, credit and debit cards, ATM and Point-of-Sale networks, and some emerging chip card technology and postal money orders. In recent years there has been an increasing tendency in several big cities in Indonesia to use payment from electronic/internet banking services.

1.3 The Institutions that Provide Payment and Settlement Services

Bank Indonesia is the main institution that provides payment and settlement services with its clearing system and BI-RTGS. In general, banks in Indonesia also provide a uniform range product for the customers, although foreign bank branches generally undertake wholesale, commercial and foreign exchange businesses. Locally incorporated banks generally provide cheque/Bilyet Giro, demand deposits and savings facilities. Those offering retail service provides credit and debit card and automated teller machine (ATM) networks and electronic fund transfer at point of sale (EFTPOS) systems. Some banks also conduct as a settlement agent for EFTPOS clearing, ATM switching network and stocks and bonds settlement.

1. Bilyet Giro are effectively crossed cheques which may be post-dated.

There are approximately 173 Commercial Banks, supporting a combined total of nearly 9,564 offices. Foreign exchange licenses are generally limited to the larger and more sophisticated institutions, many of who have involvements with foreign partners. Each of the old provinces in Indonesia has one state owned Regional Development Bank *(Bank Pengembangan Daerah - BPD),* which operates as a commercial bank and as fiscal agent for its owners.

There are also more than 9,384 Rural Credit Banks (*Bank Perkreditan Rakyat – BPR)* operating in Indonesia. BPR are institution structures operating within a geographic locality and with a restricted numbers of offices. These banks aimed to support the development and modernisation of the rural areas. Services are currently limited to passbook savings accounts and small loans. BPR hold accounts with Commercial banks and do not participate in the payments system. Payment services provided by non-bank operators are currently minimal, and largely limited to technical processing services on behalf of registered banks.

Banking activities have been formally separated from the Postal Administration (PT. Pos Indonesia), which has recently been corporatised. However, it continues to operate passbook accounts under an agency relationship with certain State Banks, and provides a Giro service covering the distant reaches of Indonesian society supported by 26,000 offices and mobile agents.

Cards operations are generally provided by licensed banks, with VISA, MasterCard and JCB being the prominent along with private-label card. American Express and Diners operate as non-bank under license from the Ministry of Finance.

1.4 Legal Framework

The Indonesian private legal system is basically governed by two codes: the Civil Code, and the Commercial Code. The Commercial Code defines the rules for some payment instruments (particularly Cheques, promissory notes, drafts and payment orders) in detail, although some of the operational provisions have been out of date. The Code by more specific legislation has been taken advantage of.

Generally, Indonesian law pertaining to payments is predicated on paper documents and evidence. While there are some precedents regarding

electronic systems, the overall position is much certain than documentation paper. As a result, the introduction of credit cards and an electronic securities settlement system is highlighting the issues to be examined in much closer detail. The new Capital Markets law introduced in October 1995 and the Company Document Act, 1997, incorporates some provisions in this area.

The core legal framework concerning Bank Indonesia and the banking sector are contained in the Central Bank Indonesia Act, No. 23, 1999, which sets the basis for Bank Indonesia's role and operations, and the Banking Act 1992 vide Banking Act 1998, covering the licensing, business's ownership and supervision of banks. To aid Bank Indonesia in its capacity to regulate and ensure a smooth payment system, regulating and supervising the national banking system, these acts are supplemented through two mechanisms:

- Regulations issuing from Bank Indonesia in the form of Decrees (called: Peraturan Bank Indonesia (PBI)) regarding general aspects of the payment systems sector (issued by the board, and primarily concerned with matter of policy: rules, sanctions, etc), and;

- More detailed Circular Letters containing explanations and procedural requirement of those PBI.

After the enactment of The Central Bank Act, Act Number 23 of 1999, Bank Indonesia has the authority to govern and safeguard the payment system in order to facilitate and secure an effective, efficient, reliable and safe national payment system. In this regard, Bank Indonesia consistently undertakes measures in this area, concerning both cash and non-cash payment instruments.

2. Existing Payment and Settlement Systems

2.1 Domestic Payments

2.1.1 General Overview

In Indonesia, inter-bank payment and settlement system are processed through the following systems:

2.1.1.1 Bank Indonesia Clearing System: consist of 102 local paper clearing houses, operated either directly at 38 Bank Indonesia offices and by 64 appointed State Bank branches as agencies;

2.1.1.2 Bank Indonesia Real Time Gross Settlement (BI-RTGS) in Jakarta, Bandung and Surabaya;

2.1.1.3 The high value inter-bank branch funds transfer system operated internally by Bank Indonesia, which provides gross settlement of transactions between BI offices on an intra-day basis (SAKTI).

Organisation of the Indonesia Inter-bank Payment

Payment Type	Transfer System		Settlement		
	Institution	Settlement Type	BI Head Office	BI Branch	Banks
Stock Exchange Market	Appointed banks	Net (T+4)	-	-	Settlement Banks
Credit Card/Shared ATM	Switching Company	Net	BI-RTGS	-	Settlement Bank
Retail Payments: Cheques; Bilyet Giro; Credit Note; Debit Note; WBUT; and SBPT	Jakarta Electronic Clearing system	Net	BI-RTGS	-	-
	BI-Branches Clearing System	Net	-	OSA*	-
Large Value Payments	BI-RTGS (BI Head Office & BI-Surabaya Branches)	Real Time	BI-RTGS	OSA	-
	SAKTI (On Line) BI branches	"Real Time"	BI-RTGS	OSA	-

* Accounting System Automation in Bank Indonesia branches.

Participation in the settlement and clearing systems is limited to commercial banks licensed and supervised by BI, also acting as the government's banker.

Transactions from other sources (e.g. Bilateral inter-bank remittance transfer or shared ATM, EFT POS, credit card transactions) may also be settled through bilateral inter-bank correspondent accounts between participants, governed by bilateral agreements, with the balances of correspondent accounts ultimately being settled through BI facilities.

The implementation of BI-RTGS system in November 2000 for the large value payment systems in Jakarta and in June 2001 of BI RTGS system in Bandung and Surabaya followed by BI decree to forbid any credit transfer (Credit Note) valued more than 1 billion rupiah to be cleared via BI's Clearing System, has substantially reduced settlement risk (credit exposure) for BI. Previously, all transactions were settled on a net settlement basis and there was no limitation on banks within the day settlement obligation and no collateral arrangements for banks, which had overdraft in the system. The BI-RTGS system settles various types of transactions on a real time basis, such as inter-bank transaction through the inter-bank money market, rupiah transactions foreign exchange settlement, payment to government account, transactions for depositing or withdrawing cash from Bank Indonesia, and transactions between bank customers.

The RTGS run simultaneous by the current clearing system that handles lower value transactions below 1 billion rupiah. BI will continue to implement RTGS in 36 BI branches across the country.

Recently, BI also operates an inter-office wire fund transfer services "SAKTI". This supports high value inter regional and inter bank credit transfers for banks that are not link with BI-RTGS, and can transfer bank funds between any two bank branches which clear through BI branches (KBI).

2.1.2 Payment Methods

2.1.2.1 Cash Payments

Cash usage in Indonesia is very high with a large and rising demand for increased quantities of cash in the real economy as a medium of exchange. Cash plays a dominant role in Indonesian for payments and continues to be the most convenient and popular form of payment for every-

day, low-value transactions. It represents an effective payment instrument available particularly in the rural area because of its low usage cost, surety, and universal acceptance. Penetrations of other payment instruments have been relatively slow and there is no alternative to cash as a payment instrument, especially in the rural area. While EFT services, such as ATMs are being introduced rapidly with many payment functions, access to such services, physical accessibility, and the direct costs, all affect the net level of penetration and consequent degree of monetisation of the economy. Other access criteria and practical consideration regarding the average wage, minimum income requirements, and level of understanding of bank services, all contributes to relatively low usage of banks and banking services. As a result of the extensive use of cash as payment instrument coupled with the lack of inter-city clearing facility, the business with national representation have to bear the cost of maintaining separate bank accounts throughout the nation so that deposits can be made locally.

The Volume of notes and coins in circulation has increased on an average of 27% annually over the past five years, and has fluctuated at approximately 40% of M1. The growth of cash ratio to GDP averaged 8.8% over the past five years. Furthermore, the preference of holding cash is increasing lately in tandem with the decline of public confidence in banking system during the economic crisis as well as the implication of liquidating of several banks a couple of years ago.

Issuing and maintaining the supply of cash to meet local demand is solely undertaken by Bank Indonesia. BI is also responsible for all cash disbursements, repatriations and transport throughout Indonesia.

At present, coins produced by Bank Indonesia are in Rp. 25, Rp. 50, Rp.100, Rp. 500, and Rp. 1,000 denominations. Notes are issued in denomination of Rp. 100, Rp. 500, Rp. 1,000, Rp. 5,000, Rp. 10,000, Rp. 20,000, Rp. 50,000 and the largest is Rp. 100,000 (equalling to approximately USD 10). The Rp. 100,000 note was introduced in 1999. Nearly all the cash value in circulation is split evenly across Rp. 10,000 and Rp. 20,000 denominations.

2.1.2.2 Non-Cash Payments

Indonesian commercial banks provide the usual variety of accounts (current/ cheque, savings, time deposit, etc), whereas BPR (rural credit banks) only offer passbook savings accounts (*tabungan*). For practical considera-

tions, current accounts with cheque facilities are limited to corporate entities or higher-income individuals. Saving accounts have been typically restricted to teller transactions. Some banks provide ATM and electronic/ internet banking access to savings accounts. There is currently limited statistics on non-cash payment instruments. Cheques (and a local variation called the *Bilyet Giro*) are the most commonly used non-cash payment instrument, and form 55% of inter-bank clearing, even though the usage of cheques/Bilyet Giro is reduced from time to time due to convenience of transferring payments via ATM/electronic banking and to avert the risk of dishonoured cheque/Bilyet Giro. Electronic direct credit and direct debit transfers can be effected within banks and mostly used for payment of utilities such as electricity, telephone, etc, but not between banks.

Cards (debit and credit, ATM and POS) are gaining popularity in the more-developed areas. POS debit cards are a recent product, and while starting from a low base are poised to undergo significant growth in the future.

a. *Credit Note (Credit Transfer)*

The papers Giro instrument called "Nota Kredit" are an increasingly popular for transferring funds among customer such as payroll or individual transfer. To make such transfers, customers are required to maintain giro or saving account in the paying bank or bring cash to the cashier. Inter-bank credit notes now comprise 50% of paper clearing activity by volume with many of these are computer generated. Most people are more confident receiving payment with this credit transfers instead of cheque or Bilyet Giro due to availability of funds (there is no risk of dishonoured Credit Note), because it is carried out by the sending bank if there are enough funds in the account.

Banks in Indonesia provide credits transfers to other account holder within the same bank or between the banks. In case the beneficiary on the other bank does not maintain bank account in that bank, the customer making the payment specifies the name of the beneficiary, the address and the bank/branch where the payment is to be made. When the transfer reaches the counterpart bank/branch, the beneficiary will notified of the remittance made and can go to the branch and withdraw the money. Banks usually will require the beneficiary to show personal identification card that would match with the beneficiary name.

All intra-bank credit transfers are processed electronically and on line. Most branches receive credit transfer instructions from customers in written form and they are sent electronically to the final destination. Most banks also provide a credit transfer facility via ATMs, the internet or telephone in a real time basis. For inter-bank credit transfer, most branches receive credit transfer instructions from customers in written form and these are convert to banks credit note and sent to clearing house for the final destinations.

Bank customers also can issue standing order for regular payments both for intra or inter-bank that were executed automatically on specific dates.

Between banks, a number of circuits can be used to effect credit transfer as follows: Bank Indonesia clearing system (still supported by credit note) for local transactions; correspondent bank networks for cross-regional transfers (electronically); and the BI's on-line transfer system (SAKTI), for intra-day and inter-regional transfers through the settlement accounts held at Bank Indonesia offices except for those cities that have implemented RTGS (electronically).

b. *Cheques and Bilyet Giro*

Paper based instruments are well established in Indonesian law and banking practices. Rules regarding cheques are detailed in Commercial Code. Bilyet Giro is regulated by Bank Indonesia decree to fill the lack of cheque, which could not treated as post date cheque. With Bilyet Giro, drawer could manage cash flow more flexible than cheque even though Bilyet Giro cannot take into cash at the cashier but account-to-account payment only.

However, personal cheques and Bilyet Giro are not well accepted primarily due to severe difficulties faced in obtaining recourse from the customer for dishonoured payment. Local conditions such as matters on the different users with the same name, frequent changes of address, incomplete street maps, irregular residential numbering systems, and delays in court proceedings, all combine prevented the effectiveness of the formally stipulated remedies for dishonoured. These market and environmental conditions result in paper based instruments being largely restricted to business enterprises, which are required by law to maintain legally acceptable nominated place of business, and many other formal relationships for taxation and other reporting purposes.

In Jakarta in the year 2000, the inter-bank paper based clearing operation processed approximately 33.7 million cheques/Bilyet Giro with a total value of some 59 trillion rupiah. In these figures, Bilyet Giro are still the most popularly used debit instrument reaching approximately 88% of the total, followed by cheques (10%) and other debit instrument (2%).

As an administrative punishment for persons who had issued a dishonoured cheques/Bilyet Giro, BI maintains a register of issuers of dishonoured cheques/Bilyet Giro called "Bank Indonesia Black List". If three cheques/ Bilyet Giro are dishonoured within a six-month period or one dishonoured cheques/Bilyet Giro with an amount more than one billion Rupiah, the issuer is "blacklisted" and barred from holding a cheque account for a period of one year.

As an international tourist destination, traveler's cheques are accepted at appropriate outlets and are accepted for inter-bank clearing. The commercial bill market is rather illiquid. There is no cashier's cheques or cheque guaranteed card in Indonesia.

c. *Direct Debits/Credits Transfers*

Currently, direct debit, which is defined as preauthorised debit on the payer's bank account initiated by the payee, is mostly available within banks and not between banks (no direct debit/direct credit clearing system). Banks usually offer a lot of incentive to persuade customers to these services instead of funds transfer between banks. The difficulties of direct debits transfer between banks is that the bank would have to prepare a lot of paper work (credit note) to match with Bank Indonesia in accordance with inter-bank clearing requirements. Some individual banks offer pre-authorised debit on their customer's account for payments for public utility services such as telephone and electricity. In this case, the account of customers and public utility companies are both kept by the same bank.

Meanwhile, debit note is processed as an inter-bank debit transfer in current paper based/electronic based clearing system. The usage of debit note is not similar with those of direct debit transfers, because it is mostly used for claiming expenses between banks. The nominal value of debit transaction that can be processed in the clearing system is limited to 10 million rupiah. By way of volume and value of transactions, debit transaction is very as low compared with other paper-based instruments being processed in Indonesia clearing system (below 1 %).

The restriction of clearing facilities to local clearing has resulted in increased market demand for inter-city and inter-regional funds transfer facilities using bank networks. This demand is being addressing through the proliferation of private networks between branches of the same banks.

2.1.2.3 Payment Cards

The use of plastic cards as a payment medium has become increasingly popular in Indonesia especially in big cities. Payment cards and associated services are a leading area of inter-bank competition and corresponding systems development, as part of each bank's overall brand and image enhancing strategy. Typically in the early stages of market development, inter-bank co-operation has been limited although these are indications of the market being mature. The development of electronic card payment instruments was in accordance with growing economic activity and also in parallel with the development of currency in circulation and clearing activities. All types of electronic cards increased at the end of the period, except SMART Cards. The value of transactions (excluding smart cards) rose 41,2% from the previous year. This has shown the increasing number of acceptance of non-cash electronic card payment instruments.

a. Credit Cards

Currently, the usage of credit card in Indonesia is common and widely accepted especially in big cities. Card operations are generally provided by licensed banks (there are now seventeen issuing banks), with VISA, MasterCard and JCB being the most popular along with other private cards. American Express and Diners operate as non-bank under license from the Ministry of Finance. Certain banks also issue proprietary credit card. Approximately 35,000 merchant outlets accept credit cards in Indonesia. There are about 2.73 million cardholders in 1999 with 29.5 million transactions amounting to 10.3 billion rupiah.

b. Debit Cards

Debit card at Point of Sale (EFT-POS) is emerging, mostly in Jakarta and other big cities. Some banks are issuing debit cards under the Maestro and Visa Electron program. Other banks are issuing proprietary cards mostly the merchant site. The lack of business agreements between various parties seems a major obstacle to achieving a "one terminal per counter" vision including a shortfall in infrastructure in facilitating common trans-

actions. There are now eight banks offering debit card facilities to their customers. In 1999, there are about 12.1 million card holders with 16 million transactions and an amount totaling about 3,200 billions rupiah.

c. Prepaid Cards

The commonly used prepaid cards are phone cards issued by PT. Telekomunikasi Indonesia Tbk. and some private telecommunication companies for making calls from public telephones.

d. Smart Cards

Some banks have smart card systems operating via tellers, ATMs or Point of Sale. Credit card issuers are believed to be watching the VISA/ MasterCard developments with interest, and other banks may launch smart card products by next year.

2.1.2.4 ATM

During the early 1990s the majority of large banks established ATM services. The number of ATMs grew rapidly until the advert of economic crisis. Currently, there are about 6,848 ATMs (per February 2001) of which 88.41% are owned by 10 banks. Currently, here are five domestic banks sharing the ATM networks (ALTO, ATM BERSAMA, CAKRA, FLASH and BCA) and two international shared ATM networks (CIRRUS and PLUS) are exist now. The decision to enter sharing arrangements is a matter of choice for individual banks. Sharing arrangements are expected to increase over time as the market becomes more serviced oriented and more matured. ATM coverage now includes the major cities in Indonesia. Most ATM operates 24 hours a day. Some banks provide ATM not only for withdrawals and account balance enquiries, but also for transferring fund to other account within the same bank, paying utilities such as telephone bills, credit card bills, etc. The debit cards and certain types of credit cards using a Personal Identification Number (PIN) can be used in the ATM and cash dispenser.

Currently, there appears to be little common in the infrastructure as well as duplication of services and equipment in the POS. Merchants may have to call several for authorisation, depending on the card type. Stores may have several terminals installed to cater for different card types accepted

when a single terminal can meet all these needs. At end of 1999, there were 7.005 POS terminals, an increase of 27.3% from 1998.

2.1.2.5 Postal Instruments

Of particular interest in respect with of the non-bank sector is the Giro service offered through the post office, which is recently in corporatised. PT Pos Indonesia supports more than 150,000 Giro accounts of which has a "Giro book" for credit remittances, and also provides a domestic and international Money order service. Money orders are generally used to remit funds to individuals who do not hold a bank account. These transactions do not interface with the banking system, except at the aggregate level where the collective float is invested on the inter-bank money market.

PT. Pos Indonesia also provides postal cheque account facilities to any firm on individual. Cheque accounts are used mostly by public institutions for collecting various types of tax, government employee payroll and retirement, utilities payments, and other individual payment transactions. PT. Pos Indonesia also issues postal traveler's cheque.

2.1.3 Structure, Operation and Administration

2.1.3.1 Automated and Integrated Intra-Office Funds Transfer System (SAKTI)

Bank Indonesia has 38 branches in all the over Indonesia region of which is each region has their own local clearing. In 1987, Bank Indonesia started to develop a computer-based accounting system. At Bank Indonesia's headquarters, the accounting application system is known as BIASA, on the Bank Indonesia Accounting Application system and was implemented since BI-RTGS was changed into BI-RTGS accounting system, while in other Bank Indonesia's offices the application is known as OSA or the Automated Accounting System.

The development of the BIASA and OSA programs started in 38 (formerly 42) offices of Bank Indonesia in July 1989 and was completed in 1994. Starting in 1994, Bank Indonesia began developing the application of funds transfer between all Bank Indonesia's offices, which was later known as SAKTI (Automated and Integrated Intra-Office Funds Transfer System). Through this system, Bank Indonesia's intra-office funds transfers are now done using an electronic delivery system, instead of the mail sys-

tem, telex and telephone. Banks also use this system to transfer money from one bank branch to another branch in other region, of which most transfers are between branches and the Jakarta head office. The system is mainly utilised to square the positions of banks participating in the local clearing houses.

a. Participant in the System

All Bank Indonesia's offices and branches are participants in the system. The participants should submit an authorised signature specimen to be registered in Bank Indonesia, to serve as a tool for validating payments written order signed by the banks to effect transfer via SAKTI.

b. Types of Transaction Handled

SAKTI, a sub-system of BIASA/OSA, is a facility which replaces the telex and telephones previously used to conduct inter-office transactions in BI with electronic data transmission using VSAT and Frame Relay facilities. With SAKTI, Bank Indonesia began the application of paperless transactions for the electronic transmission and recording BI's inter office transactions While in terms of bookkeeping, transactions still use paper documents (Bank Indonesia's Bilyet Giro or Bank Indonesia's cheque) submitted by banks or other parties that conduct transaction via Bank Indonesia.

Most transfers are between branches and the Jakarta head office. The system is mainly utilised to square the positions of banks participating in the local clearing houses.

c. Description of How the System Operates

The previous telex transfer system between branch settlement accounts is being replaced by the automated online SAKTI system from late 1995. Each credit transfer involves authorisation of the instruction, debiting the sending bank's settlement account, generation transmission and confirmation of authenticated telex messages, and crediting of the receiving bank's settlement account. For security purposes, the process involves authentication, dual control and proof of bank signature at Bank Indonesia's Bilyet Giro/ cheques compared with specimen registered in Bank Indonesia data based. Under Bank Indonesia regulation, only cleared funds can be posted to settlement accounts. The telex/SAKTI system only processes credit transfers,

which each transaction being debited against the sending bank's settlement account before the transfer is executed. It therefore provides a form of "real time gross settlement", and as such settlement risk are minimised. In areas that already implemented BI-RTGS such as in Jakarta, Bandung and Surabaya, inter-branch payment transfer can be initiated from BI-RTGS instead of paper instruction. SAKTI commences its operations from 07.00 a.m. until end of day on each working day at Bank Indonesia Branches (approximately at 8.00 p.m.).

d. Volume of Transaction Handled

The volume and value of SAKTI transactions daily average in July 2001 were 7.981 transactions and Rp. 49,8 trillions respectively. All were processed in BI Branches.

e. Settlement Procedure

Settlement accounts of commercial banks are maintained in each Bank Indonesia Branch operating within the locally and under its jurisdiction, is obligated to settle bank accounts operating in credit at all times. And the off-setting of balances between settlement accounts by the same bank at different Bank Indonesia Branches is not allowed, except for Bank Indonesia branches that have already linkages by BI-RTGS system such as in Jakarta, Bandung and Surabaya where all the settlement figure will be centralised at Bank Indonesia headquarters in Jakarta.

Each transaction is individually settled with finality as it occurs during the day. A limited interface between the paper clearing system and the wire transfer system has also been develop, whereby after /Bank Indonesia Bilyet Giro/cheques drawn on a bank's settlement account have been cleared the funds are remitted via wire to another region.

f. Pricing Policy

SAKTI charges Rp. 15.000 per transaction and initiated by paper instruction (Bank Indonesia's Bilyet Giro).

g. Risk Control in the Indonesia's Payment Systems

Bank Indonesia is both the central bank and the operator of the clearing and RTGS services in Indonesia. As such it may be seen under certain

circumstances as underwriting the financial stability of the clearing and settlement systems.

In the case of Payment System risks, this principle is stated as: "those parties who enter into inter-bank value transfer arrangements from which they derive a benefit must also be the parties who bear the associated costs and risks".

In accordance with this principle, Bank Indonesia will reduce its exposure as guaranteed of the orderly and fully funded daily settlement by ensuring that payment system risks are borne by those parties involved in the risks taking and who were benefit directly from the arrangements and business transactions.

Banks are required to maintain minimum reserve level, about 5% in the form of demand deposits. Banks are also responsible for maintaining an adequate level of funding in settlement accounts to meet daily settlement obligations, without any specific collateral requirements. Bank Indonesia applies sanctions where settlement accounts are in a debit position. Settlement accounts do not yield interest on balances. In the case of bank branch (or head office) requiring additional funding to cover a debit position, the general procedure is as follows:

1. Advise its head office, to arrange telex/on-line transfer from other branches;
2. Raise funds on the money market, which operates mainly in Jakarta;
3. Normal Repo against securities held with Bank Indonesia, or
4. As a "lender of last resort", special liquidity credit is provided by Bank Indonesia against other collaterals (FLI).

2.1.3.2 Bank Indonesia Local Clearing System

According to the operational role, article 17 of the Bank Indonesia Act (1999) which replaced former Central Bank Act (1968), states that the arrangement of the inter-bank clearing system shall be conducted by bank Indonesia or other parties upon the approval of Bank Indonesia. Bank Indonesia shall also arrange the final settlement of inter-bank payment transaction.

The current clearing system provides same day clearing and settlement within separate localised clearing areas. There is no inter-city clearing system and all payments must be cleared between two participants

of the local clearing – where local clearing parties are the individual bank branches.

Historically, separate, stand-alone paper-based accounting and reporting systems have met the payment needs associated with a large population spread throughout an extensive archipelago. With the relatively slow and expensive existing communication facilities, the development of strongly decentralised systems are called for.

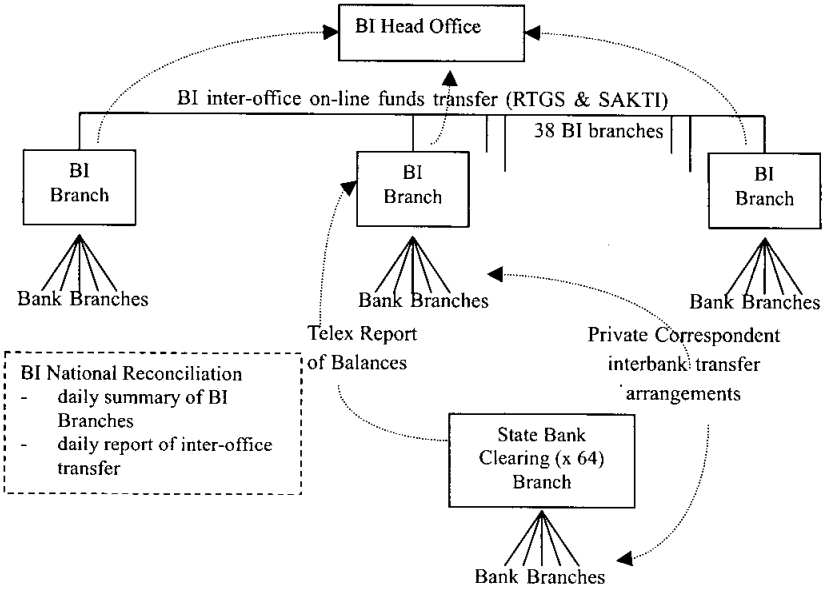
Recent modernisation programs for clearing services have introduced electronic and paper item (clearing notes) reader/sorter machines in three major cities (Jakarta, Medan and Surabaya) to increase throughput. There are 102 local clearing houses all over Indonesia are operated by Bank Indonesia branches and Head Office In Jakarta and by local branches of state banks (funded by Bank Indonesia). Bank Indonesia Head Office in Jakarta is operating the Electronic Clearing System (SKEJ) that is still supported by submitting clearing notes. Bank Indonesia branches in Medan and Surabaya are operating Automatic Clearing system and the rest of the thirty five branches in other cities and nineteen clearing system in local clearing area are operating Semi Automatic Local Clearing (called SOKL) of which the participants exchange paper between themselves in parallel, with the electronic clearing based on matching input contained in diskettes performed by the clearing centre[2]. Traditional manual clearing is also operated in forty-five local clearing centers with relatively small number of clearing participants and volume (smaller cities). With no national clearing center and inter-city clearing services at sight. Therefore, BI plans to offer inter-bank bulk electronic funds transfer and inter-city clearing in the future near.

The total value cleared at the Jakarta (the largest in Indonesia) is around 3 Trillion Indonesian rupiah daily (approximately USD. 3 billions) with 150.000 clearing transactions. The total value cleared in Indonesia (including Jakarta) is around 8 trillion Indonesian rupiah daily (approximately USD8 billion) with a total of 280.000 clearing transactions. The clearing system is based on end-of-day deferred net settlement. Risk management is not yet in place. There is no failure-to-settle arrangement, and no collateral imposed on the participating banks. However, if at the end of the day

2. This Semi Otomasi Kliring Lokal / Semi Automated Local Clearing (SOKL) has been developed locally to meet local needs.

the overdraft bank account at BI is not squared until the next morning, Bank Indonesia will suspend the bank as a clearing participant until the overdraft has been squared.

The general configuration of the present local clearing is shown in this figure:



a. Participants in The System

Only banks could become a participant for Bank Indonesia clearing system. Generally the membership of participants will be divided into two types of membership: direct participant and indirect participant. Direct participants could send and receive payment via clearing by using their own bank codes, whereas indirect participants only could send payment using their own direct bank codes. The number of participants in the bank clearing system in 2000 fell to 1,973 banks from 2,178 banks in 1999.

b. Types of Transaction and Volume Handled

The paper-based instruments (clearing note) settled through BI Clearing system are "Nota Kredit" (inter-bank credit note) and several forms of debit instruments, such as "Cek" (cheque), "Bilyet Giro", "Nota Debit",

"Wesel Bank Untuk Transfer (WBUT)", and "Surat Bukti Penerimaan Transfer (SBPT)".

Nota Kredit or Credit Note is a document used to transfer funds from submitting bank for the benefit of the recipient bank's customer.

Cheque is a debit instrument following the international standard and practices that contains unconditional instructions to a bank maintaining the customer's current account to pay certain amount of money to certain individual appointed by the customer or the bearer.

Bilyet Giro is a non-negotiable debit instrument, which contains an instruction from a customer to the bank maintaining the customers current account to conduct a current account transfer to the recipient whose name was stated, at the same bank or at another bank.

Nota Debit or Debit Note is a document used to collect funds from another bank for the benefit of the submitting bank. The cleared debit note had to be agreed upon and confirmed by the bank submitting the debit note to the recipient bank.

WBUT is a bank draft transfer, issued by a special bank for transfer purposes.

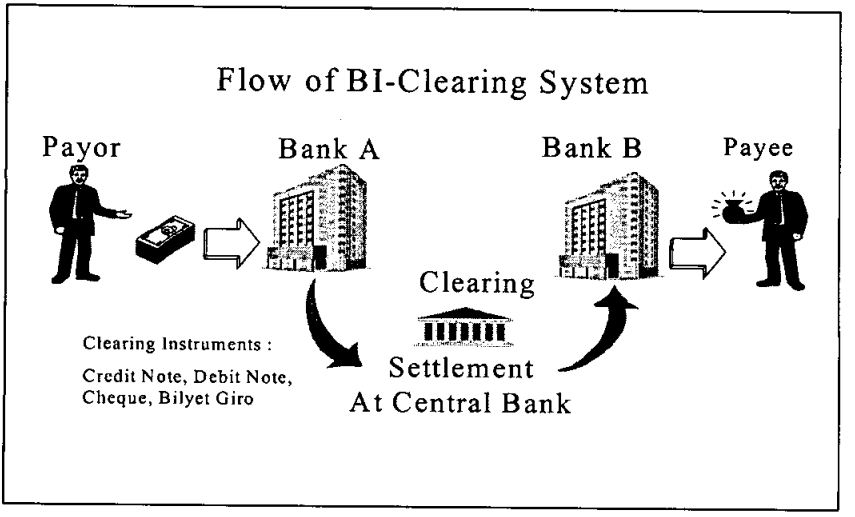
SBPT is similar to letter evidencing receipt of transfer. It is a proof of having received a transfer from another bank or another city payable by the participating bank of the recipient of the transfer fund via local clearing and also payable directly as cash to recipient without deposit account.

These last two clearing instruments (WBUT and SBPT) are now almost never used in any business activity. Practically, only credit note, cheque, Bilyet Giro and debit note that are used for daily clearing.

Debit items (cheque, Bilyet Giro and Debit Note) accounted for the biggest share of clearing volume, at 54,6%, while credit items accounted for 45.5%. Bilyet Giro is the most popular debit instrument with the share amounting to 48.2% of total items (debit and credit), followed by cheques with 6,1%. This means that other debit instruments are rarely or has never been used.

All these documents had to be expressed in rupiah currency with 100% face value and matured by the time of clearing.

The volume and value of clearing notes turnover processed in all clearing houses are increasing in parallel with the growing of economic activity after the Asian financial crisis in 1997. As of the year-end 2000, a total of 35,650,000 and 38,057.000 clearing note and amounting to Rp. 6,222 trillion and Rp. 6,222 trillion and Rp. 1,082 trillion in Jakarta and outside Jakarta, respectively, were processed in Indonesia.

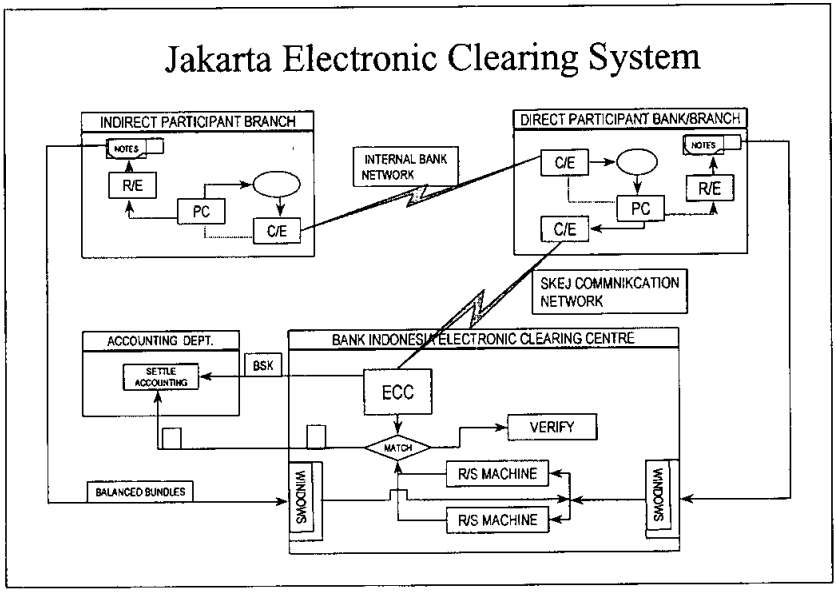


c. Description of How The System Operates

Jakarta Electronic Clearing System (Sistem Kliring Electronic Jakarta (SKEJ))

In the SKEJ, settlements among participating banks within a local clearing region will be managed by a clearing house through an electronic network. This system will enable the clearing process to operate faster, more accurately, and with greater security in the transfer of information and processing of clearing notes, clearing data, and settlements. The system will also assure greater accuracy in processing information while minimising the risk of unprocessed clearing notes and providing faster access to information on clearing output.

SKEJ has two major components namely: the central clearing computer on the clearing house and electronic clearing terminals for each participant. SKEJ will provide electronic information retail transfer between participating banks and Bank Indonesia with the aim of reducing processing time and submitting clearing notes problems due to heavy traffic in Jakarta.



Due to the needs to have fast final figure of banks account held in Bank Indonesia at the end of the working day after implementation of RTGS in Jakarta, and avoid float and liquidity risk from the net clearing balances result, Bank Indonesia enacted a transaction cap regulation and new clearing time schedule in August 1999, which divided clearing time table into two clearing schedule: High Value Clearing and Retail Clearing

Bank Indonesia High Value Clearing

High value clearing process only cheque and Bilyet Giro transactions with a nominal value of Rp. 100 million and above. The notes are sent log batches to the clearing house from 8.30 a.m. until the cut off time 10.30 p.m. to be processed by a reader sorter machine. Information about the net

clearing balances will be broadcast to the banks and settled to the banks held account in Bank Indonesia from 12.00- 13.00 p.m. The inward items and reports are collected by the banks at 13.15 p.m. on the same day.

All dishonoured cheques and/or Bilyet Giro are returned to the presenting bank through the Semi Automated Return Clearing System (using diskette as medium to return clearing data) from 14.30 until the cut off time at 4.00 p.m. Information about the net clearing balances will be broadcast to the banks and settled to the banks account held in Bank Indonesia at 16.30 p.m. The inward items and reports for the high value clearing are collected by the banks from 6.00 to 7.00 p.m. on the same day.

Bank Indonesia Retail Clearing

Bank Indonesia Retail Clearing processes cheque and Bilyet Giro transactions with a nominal value below Rp. 100 million Credit Notes with a nominal value below Rp. 1 billion and Debit Note with a nominal value below Rp. 10 million. The clearing notes are sent by batches to the clearinghouse from 10.30 a.m. until the cut off time at 13:30 p.m., to be processed by a reader sorter machine. Information about the net clearing balances will be broadcast to the banks and settled to the banks account held in Bank Indonesia at 16.30 p.m. The inward items and reports are collected by the banks from 6.00 to 7.00 p.m. on the same day.

All dishonoured cheques and/or Bilyet Giro are returned to the presenting bank through semi automated return clearing system (using diskette as medium to return clearing data) in the next working day from 8.30 a.m. until the cut off time at 10.30 a.m. From the clearing data the diskette submitted by the recipients bank, the central clearing computer in Bank Indonesia will calculate the clearing outputs to create reports giving details of inward and outward items, and net clearing balances of each bank to settle the clearing figure in the banks account held in Bank Indonesia from 12:00 to 13:00 p.m. The inward items and reports are collected by the banks at 13:15 p.m. At this time, the collecting bank could pay the customer, which the cheque/Bilyet Giro was not returned by the drawee bank.

For the credit note that the recipient bank could not settle into the customer account due to wrong encoding or other reasons, the recipient bank will return it to the presenting bank through a new clearing cycle and a new Credit Note with some explanation.

The mechanism of this system is described as follows:

1. The customer submits retail-clearing notes at the bank.
2. The bank encodes the clearing note using an encoder and magnetic ink character recognition (MICR) code and bundles it into batches of 200 items. It also notes, reads, and records the clearing note information using the reader encoder machines.
3. The recorded information is then transferred electronically by batches by the direct participants to the central clearing computer through a communications network from 10.30 a.m. until the cut off time at 3:00 p.m. on each working day. For the data communications network, this system with the use of digital telephone communications infrastructure through fiber optic cables offers high data transfer capacity.
4. The notes are then sent by batches to the clearing house later on the same day from 2:00 p.m. until the cut off time at 4:00 p.m. and will be processed off-line using reader sorter machine.
5. The central clearing computer will calculate the clearing outputs from the on-line data sent by banks to provide early information at 4.30 p.m. and to create reports giving details of inward and outward items, and net clearing balances of each bank/branch (direct participants). These reports also will be matched with the outputs from the reader sorter machine to create discrepancies reports for the banks. Apart from these reports, the inward clearing data are also available in tapes format. The inward items and reports are collected by the banks from 6.00 to 7.00 p.m.
6. Simultaneously with activity no. 5, the clearing house will then arrange the settlement according to the consolidated outward/inward reports showing the multilateral net clearing balances of each bank to the bank account maintained in Bank Indonesia around at 4.30 p.m. on the same day.

Bank Indonesia Automated Clearing System (Medan and Surabaya)

In Medan and Surabaya all the banks and branches clear all the transaction through the Automated Clearing System. Since automated clearing system used a specific computer system, the clearing notes to be calculated in the clearing system had to fulfill certain standard requirements relating to format, size, paper quality, printing quality and system and quoting information in Magnetic Ink Character Recognition (MICR). The clearing houses receive by batches the clearing paper from all the clearing participants as input batches, and the reader sorter machine of the clearing houses reads the data by batches and all the paper clearing items inside, offsets

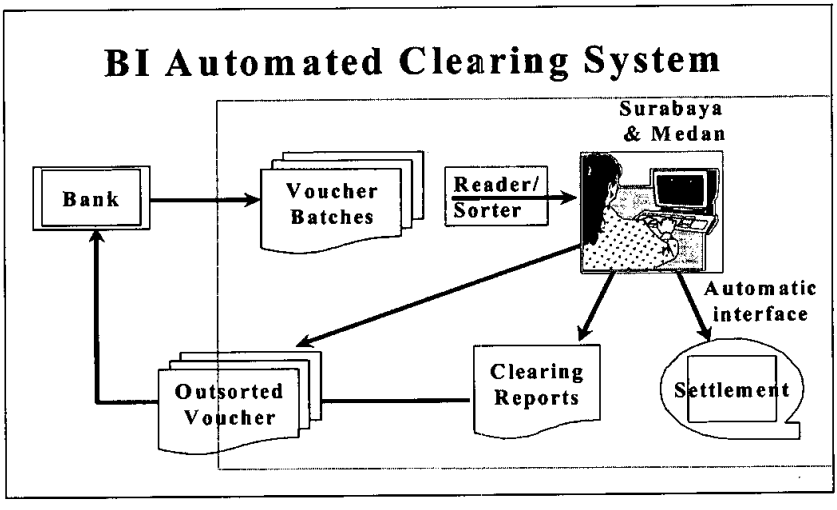
them, and sorts the items by recipient participant. After the offsetting process (the same process with electronic clearing), the clearing figures of the Jakarta automated clearing house are interfaced with the RTGS for posting to banks' settlement account. And the clearing figures of Medan and Surabaya automated clearing houses are interfaced with the BI-Branch Accounting System of Medan and Surabaya (due to the BI-RTGS that was implemented already in Surabaya, all clearing figures of the banks in Surabaya will be merged to the bank account held in Bank Indonesia head office in Jakarta).

To support the implementation of electronic clearing, the existing paper based system will be enhanced to image technology. This system will use readers and sorters capable of capturing the entire information in the clearing notes in rapid succession without having to rely on physical examination of the notes by human operators.

For the clearing house, the image technology offers the advantage of minimising the number of operators required for processing the reject re-entry and balancing, thus speeding up the processing of the reject re-entry and balancing, and provides easier means of tracing the causes of imbalances. These tasks are assisted by artificial intelligence software connected to the image database. Clearing participants can make use of the electronic images of notes sent by the clearinghouse through the electronic communications network.

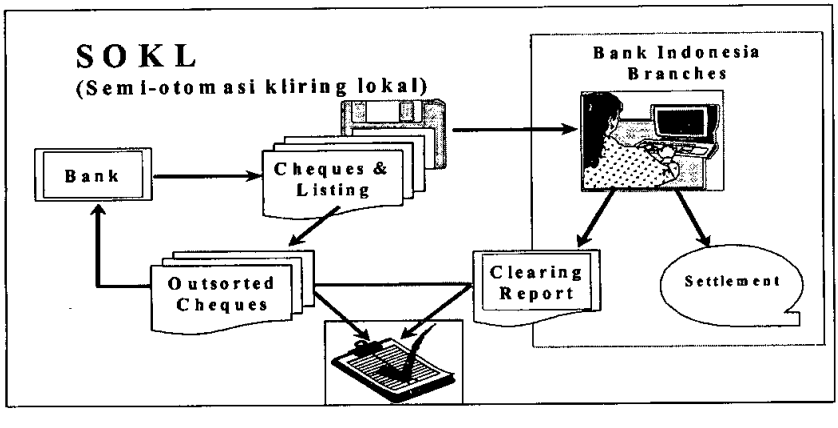
The operating process of this system is almost similar with that of the off-line paper-based clearing in Jakarta Electronic Clearing System. In the Automated Clearing System, the clearing notes by batches/bundles that were physically received by the clearinghouse from participant's bank will be sorted and captured by the reader sorter machines through on-line mode. This means that the clearing figures from MICR code on the clearing notes will be the basis for clearing calculations to produce the net clearing balances.

All dishonoured cheques and/or Bilyet Giro are returned to the presenting bank through the same system used in Jakarta Electronic Clearing System. For the credit note that the recipient's bank could not book funds into customer account due to wrong encoding or other reasons, the recipient's bank will return it to the presenting bank through a new clearing cycle and a new Credit Note with some explanations.



Bank Indonesia Semi Automated Clearing System (SOKL)

At the remaining 35 BI-Branches where the number of participant and clearing documents are still low, a semi-automated local clearing system (called SOKL) is used. In the SOKL, Banks submit a file on the diskette containing information on the clearing notes to the clearing house (Bank Indonesia Branches or appointed state banks) for calculation of settlement positions and production of reports, while participants interchanged related paper items between themselves and reconcile outputs at the clearing house.



The clearing timetables vary from region to region, but most of them will clear on the first clearing and the return items on the same day. Both high value transactions and retail transactions will be processed at the same system and clearing schedule.

Manual Clearing System

The clearing undertaken by the branches of state banks in the regions with no BI-Branch are mostly performed on a "manual" basis. At these regions (usually in the small cities), the volumes are relatively small, and the papers are exchange manually between participants.

Bank generally accepts the transactions up to 11 a.m. for inputting to the clearing houses before 2 p.m. After processing by the clearing house, banks complete their own processing of output items against customer accounts and generate dishonoured returns (for dishonoured cheque and/or Bilyet Giro) on the same day.

d. Volume of Transactions Handled

Operationally, there are four types of clearing houses according to the volume of items processed and the technology employed as in the table below.

No.	Type of Clearing	Daily Volume	City/Profile
1.	Electronic	> 150,000/day	Jakarta Electronic Clearing System, process almost 45% of total national clearing volume transaction.
2.	Automated	> 30,000/day	Surabaya and Medan Automated Clearing System, paper clearing in batches submit to clearing house to be sorted and image capturing by reader sorter.
3.	Semi Automated	< 20,000/day	35 Bank Indonesia branches and 19 State Banks Agency clearing centers utilise manual exchanging of pre-sorted batches, with calculation of settlement positions based on electronic records of items pre-captured by banks on diskettes.
4.	Manual	< 5,000/day	At 45 State Banks agency centres, banks manually exchange items and calculate settlement positions.

e. Settlement Procedures

Current settlement arrangements in Indonesia are localised to each Bank Indonesia branch. Recent consolidation of accounts and general ledger codes within the Bank Indonesia Branches accounting system, are expected to result in substantial improvements in the settlement account balance reporting.

Bank Indonesia clearing system is settled on a multilateral net basis at the end of the same day (T+0). An "early warning" system of net settlement position is created by Bank Indonesia clearing system after all input has been initially processed – at approximately 3:30 – 4:00 pm in Jakarta and at 12:30 pm in smaller centres. The clearing system is based on end-of-day deferred net settlement.

For the settlement, the clearing house clearing figured interfaces with the BI-Branch Accounting System for posting to banks' settlement account. The participants of semi-automated, Medan and Surabaya automated clearing houses are the BI-Branches. All banks' branches holding their settlement account at the BI-Branch Accounting System, and the head office of banks, if any, located in the same region hold their settlement account at the BI-branch Accounting System.

f. Pricing Policies

Bank Indonesia charges Rp. 500 per clearing item in electronic or automated clearing, Rp. 5,000 per return items for dishonoured cheque/Bilyet Giro and a penalty charge of Rp. 1,000 per rejected item from electronic supporting paper/automated paper processing if these will exceed 2% of the total output. For semi automated clearing (SOKL) Bank Indonesia charges Rp. 250 per clearing item and Rp. 2,500 per return items. These fees are believed to be adequate in recovering administrative costs.

g. Management of Risks

The design and operation of the Clearing Systems in Indonesia are based primarily on end of day settlement. In particular, settlement of Money Market transactions, including those Money Market transactions undertaken to square the expected settlement account shortfalls or surpluses, is effected through the paper clearing system in Bank Indonesia Branches.

Risk management is not yet in place. There is no failure-to-settle arrangement, and no collateral imposed on the participating banks.

However, to avoid credit or liquidity risk, recently the Bank Indonesia has issued a clearing suspension policy. The enactment of the provision on suspension from the clearing system is intended to minimise payment system risks. This is achieved by restricting the obligations of Bank Indonesia to absorb the risks emerging from unsettled inter-bank transactions.

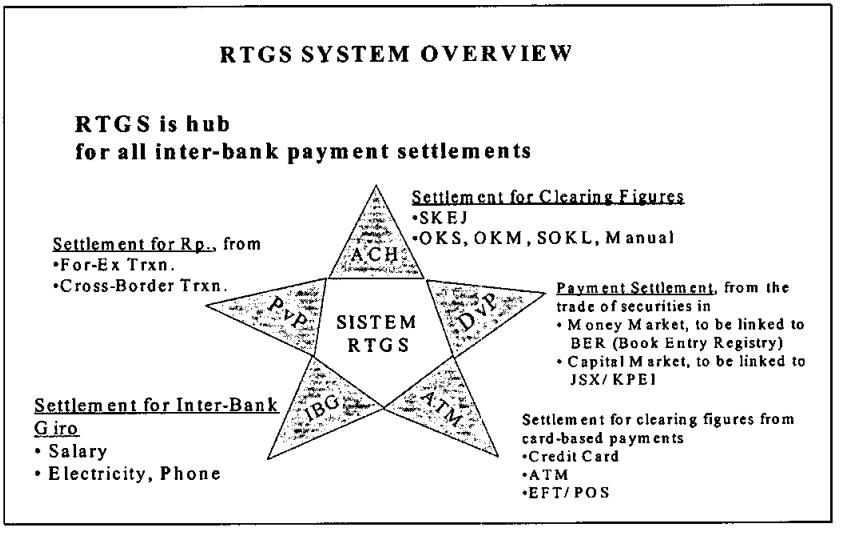
This clearing suspension policy is in line with the provisions under law No. 23 of 1999 that restricts credit extension by Bank Indonesia to the banking sector. Banks that day failed to settle their inter bank obligations at the end of the day, will be suspended from participation in the clearing process if, by the next morning of the working day (9.00 a.m.) they will not return the overdraft provided by Bank Indonesia to settle their clearing obligations.

2.1.3.3 Bank Indonesia Real Time Gross Settlement (BI-RTGS)

To support the effective implementation of monetary policy and the accelerate the recovery of the banking industry, payment system policies will be aimed at speeding up the development and implementation of an efficient, accurate, safe and reliable payment system by enhancing the quality of the service. One way to achieve this is through the implementation of the Real Time Gross Settlement System (BI-RTGS) that was implemented since 17th November 2000 in Jakarta. Recently BI-RTGS was also implemented in Bandung on 1 June 2001, and Surabaya on 6 July 2001 and gradually will be implemented in other 10 Bank Indonesia offices across the nation in 2001.

The implementation of the BI-RTGS system benefited not only the banking industry but also the public and economy as a whole. As far as the public is concern, in addition to providing speed and reliability, this system also provides certainty in sending and receiving funds, thus facilitates planning of economic activities. As far as the Bank Indonesia is concern, the system is useful in reducing payment system risks and speculative activities by participant banks. In addition, the RTGS system can also be a source of accurate information for bank oversight activities and for the implementation of monetary policy. It will make easier the duty of Bank Indonesia in monitoring the bank compliance with the minimum reserve requirement. The combine accounts can also be useful as an early warning

system to monitor which banks are experiencing liquidity problems. Participant banks can also monitor and manage their liquidity efficiently and effectively.



a. Participants in the System

Currently, only banks are allowed to participate in BI-RTGS and all banks operating in Jakarta have become RTGS members (obligated) since day one (one bank one member).

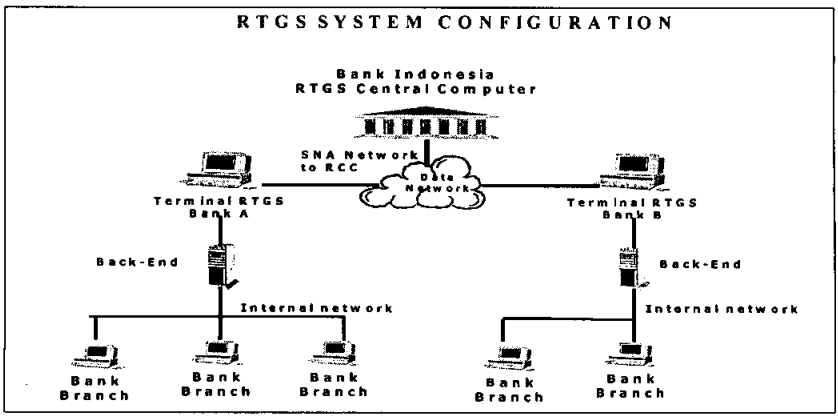
b. Types of Transaction Handled

BI-RTGS could only allow banks to send credit transfer and obligate its bank to have sufficient fund in its settlement account at Bank Indonesia (no money no game). If the balances position of the sending bank which will be debited have not enough money compare with the value of its transactions, queue management and gridlock resolution will take place after a particular period of time determined automatically by the systems.

The BI-RTGS system settles various types of transaction on a real time basis, such as inter-bank transaction through the inter-bank money market, rupiah transactions foreign exchange settlement, payment to government account, transactions for depositing or withdrawing cash from Bank Indonesia, and transactions between bank customers.

c. Description of How the System Operates

As operated by most RTGS operator in the world, BI-RTGS is using V-shaped structure for transmitting messages from one bank to another bank through Bank Indonesia as RTGS operator. Transaction time starts from 6:30 a.m. until 6 p.m. Cash transactions starting from 6:30 a.m. until 11:00 a.m. Taxes transaction from 6:30 a.m. until 10:00 a.m. Inter-bank transactions starting from 6:30 a.m. until 6:00 p.m. Fund transfer from head office to BI Branches starting from 6.30 a.m. until 3.00 a.m. to meet which the local working hour in eastern Indonesia region with have two hours different time zone. Those time windows hopefully would accommodate all stakeholders across the country, which have 3 times zone, to smoothen large value payment system in Indonesia.



e. Volume Transaction Handled

The average daily value of RTGS transactions at Jakarta is around 50 Trillion Indonesian Rupiah (approximately USD. 50 billions) with an average of 3.200 transactions per day.

f. Settlement Procedures

All transactions received at Bank Indonesia's RTGS central computer are executed in a real time basis as long as there is enough fund at sending bank's settlement account. Settlement is final and irrevocable. The balances are updated by incoming and outgoing payments from BI-RTGS and from other sources such as final clearing figures.

The integration of the BI-RTGS system in Bank Indonesia head office and its regional offices will bring about a centralised settlement account, in which all commercial bank accounts currently residing in each Bank Indonesia regional office will be merged into one account residing in one location, but can be accessed from any point in Indonesia.

g. Pricing Policies

Bank Indonesia charges Rp. 10,000 per single RTGS transaction and charges Rp. 50.000 for multiple credit transactions (up to ten beneficiaries).

h. Management of Risk

The safety and public confidence of the Banking system rely on the underlying good management of all the operational and financial components of the banking system. If settlement is deferred through the use of netting arrangements, then the identification of any bank level of liquidity or credit risk is also deferred. During any such deferral, risks can be compounded and their size may become greater than the resources and management capabilities of any one institution apart from the Central Bank, which would then be required to meet these risks. To reduce these risks in the clearing system, credit transfer, created by banks in Jakarta worth 1 billion Rupiah or more (> Rp.1, 000,000,000.00) are not allowed to be processed through Jakarta Clearing House, and have to go through RTGS.

Also with BI-RTGS, credit exposure that used to come from final clearing figure, could be minimised by giving the maximal cap for the clearing value per transaction, and shifted large value payment system to RTGS transaction that required sufficient fund before transaction executed.

To avoid gridlock in the system, BI provides an intra-day liquidity support, named the Intra-day Liquidity Facility (FLI). The FLI is given based on the assessment of collateral owned by a bank proposing the FLI at T-1. The collateral of the FLI is Certificate Bank Indonesia (SBI on Certificate of Bank Indonesia, an instrument used in the Open Market Operation mainly for monetary contraction) and/or Government Bond, which are both administered in the Book Entry Registry at BI-Head Office. From a technical point of view, a bank, which is given the FLI, is allowed to be overdrawn at T+0 with a determined limit based on the assessment.

The BI-RTGS regulation also state rights and obligation between participants and RTGS operator, including the obligation to have a back up system and contingency plan to ensure that clearing operation can still be done under extreme condition. Hopefully these procedures could help to avoid any operational and systemic risk.

2.2 Cross Border Payments

2.2.1 General Overview

Indonesian cross border funds flows are increasing rapidly as the Indonesia economy continues to expand and become more integrated within the global economy of internationally traded goods and services. This growth in cross border payment are supported by:

- Indonesia's rapidly open capital account policy;
- The rapid development of the Indonesian capital market in equities and the activities of foreign investors in this market through local brokers and global securities custodians;
- The use of foreign correspondents to remit funds between Indonesian banks in response to the timeliness offered by such services in comparison with locally available alternatives;
- The increasing sophistication of Indonesian banks in accessing and using the foreign exchange markets;
- The current restrictions on the local issuing foreign currency instrument.

The increasing volume and diversity of these cross border funds flows have two important effects from a central bank and payment system perspective follows:

(a) These funds flows are taking place largely outside the view and reach of the Indonesian authorities. Consequently, it is unclear whether these fund flows are for the purposes of speculative investment, international trade, direct investment or evidence of domestic banks managing their cash positions through the efficient transfer systems available to them.
(b) Participants to these payments are increasing their exposure to direct losses if the foreign counter-party bank should fail to settle the foreign leg of the transaction at some time after the Indonesian bank has already settled the rupiah leg.

The Indonesia banking system has strengthened its presence in the international market over the last few years especially after the Asian finan-

cial turbulence hit Indonesia few years ago, through local banks establishing offshore operations and foreign bank establishing direct representation.

International transfers of both small and large value payments are mainly handled by the banks. The Post Office and credit card companies are also involved in small-value international payments.

2.2.2 Payment and Settlement Method

The S.W.I.F.T. network is the main channel for transmitting information on cross-border payments for international funds transfers of which banks rely on their foreign correspondent network. The paying bank instructs a foreign correspondent to debit its foreign account and to transfer the amount to a corresponding credit bank for crediting to the latter's account. To carry out the instructions they receive, the foreign correspondent banks use their domestic clearing and settlement systems. At the end of 2000, SWIFT membership in Indonesia accounted for 56 banks. Bank Indonesia is a member of S.W.I.F.T and has over 500 correspondent bank relationships. Bank Indonesia also guarantees USD convertibility of the rupiah at a specific daily rate, set at a broader spread than the actual market in normal times. Certain foreign banks with Indonesian branches also have correspondent relationships with a large number of Indonesian banks.

Retail payments for cross border transactions are conducted by banks, credit card companies and the post office. Customer of banks in Indonesia are allowed to open a foreign currency deposit account at the financial institutions in Indonesia, therefore it allow them to transfer funds from the said account for payment of transactions payable in foreign currency. Credit card payments are settled through credit cards clearing run by the credit card companies.

International electronic commerce transactions especially for business-to-business transaction and consumer to business transaction, particularly those trading over the Internet, have been on the rise in Indonesia of which, the means of payment over the Internet are mainly based on credit card number.

Indonesian workers who are working abroad from the rural area (village) where few banks operated and cross border remittances through the banking system has encountered obstacles such proximity of banks which is costly in terms of time and expenses incurred and the perception that

banks are mansion-like which are exclusive for certain category of society. Nowadays, with the advantages of post offices, which are scattered in remote areas, cross border remittances can be sent and received via the post offices. There are agreements and contracts with its counterparts in more than 15 countries. Since the Post Bank had been closed, settlement is carried out via a correspondent bank.

Traveller's cheques could be bought and sold in Indonesia especially those from leading banks from abroad. There are no specific systems in Indonesia for the local settlement of foreign exchange transactions between domestic institutions.

3. The Implications of the Existing Payment and Settlement Systems for Financial Stability

3.1 Monetary Policy

The current Bank Indonesia Act (1999) states "Bank Indonesia shall, in order to achieve and maintain the stability of the rupiah (the objective), assume the following tasks as follows:

1. To formulate and to implement monetary policy;
2. To regulate and to safeguard the smooth operation of the payment system;
3. To regulate and to supervise banks."

To stabilise the rupiah, the strategy of monetary policy during the year under review was still based on the control of the quantity of base money as the operational target. To achieve it's based money targets, Bank Indonesia consistently relied upon open the market operation instruments, especially through BI certificate (SBI) auctions for 1-month and 3-month periods and rupiah interventions in the money market. The strategy of controlling the money supply through open market operations was accompanied by measures to dampen excessive exchange rate fluctuation. Policy measures include sterilisation operations in the foreign exchange market to absorb monetary expansion caused by government rupiah expenditure financed by fund originating from offshore. In addition, BI also conducted direct monitoring at a number of banks to increase compliance with prudential regulations that relate to foreign exchange transactions, in addition to monitoring vostro accounts as an initial step toward limiting rupiah transaction by non-residents.

As a management tool, the payment system can assist the efficient implementation of monetary policy through the provision of complete, accurate and timely information regarding the level and movements of base money in the financial system. A well-designed and operationally efficient national payments system can also provide an important operational channel through which the Central Bank can transact its Open Market Operation.

3.1.1 Timely Information

At an operational level, the effectiveness of the implementation of Monetary Policy in respect with the base money management and control depends heavily on the timeliness and completeness of the reports which track and monitor the actual net inflows and outflows of funds of settlement account transaction and balances.

With the enhancement of the payment and settlement system in Indonesia, especially with the establishment of the BI-RTGS system, information gathering about banks liquidity on banks settlement account in Bank Indonesia will be faster and easier to monitor by central bank to conduct appropriate monetary policy. Banks can also "see" their balance from time to time on a real time basis, and therefore, can manage cash flows better to avoid excessive amount in the account.

3.1.2 Effective Conduct/Implementation of Monetary Policy

To support the effective implementation of monetary policy and to accelerate the recovery of the banking industry, payment system policy will be directed toward accelerating the development and implementation of a national payment system that is efficient, accurate, fast, safe and reliable through improvements of service quality to support the effective implementation of monetary policy and to support efforts to create a sound banking system. Defined broadly, payment system policy consist of currency in circulation policy and policy to improve Bank Indonesia's service in providing a smooth functioning payment system.

At an operational level, the effectiveness of the monetary policy in respect with the base money management and control depends on the accuracy of the predictions of net inflows and outflows of funds to/from the daily pool of M0 liquidity in the form of settlement account transactions and balances.

The RTGS and other enhancement of payment system in Indonesia are expected to take Indonesia's financial market infrastructure to a new level of sophistication. As the basis for modern financial infrastructure, the RTGS system will create a condition known as "delivery versus payment system" in the money and stock markets, significantly reducing risks in these two markets. The BI-RTGS system could also reduce risk in the foreign exchange market by providing a so-called "payment versus payment facility" between inter-bank settlement in rupiah and inter-bank settlement in other currencies. Therefore with the RTGS system, the range of qualified payments in the system will be available to absorb, inject funds, and manage the net levels of liquidity in the banking system. With the BI-RTGS, the management and control of other transactions between BI and banks such as foreign exchange trading, disbursement of government expenditures, collection of taxes, and the terms and conditions governing the provision and use of BI-RTGS settlement accounts for the posting of transaction arising from Open Market Operations, could be monitored easily, accurate and effectively for proper conduct of monetary policy. This will provide improved control over the aggregated liquidity of settlement accounts and greatly increase both the efficiency and market responsiveness to the bank's open market operations.

The changing in the Jakarta clearing scheduled from T+1 to T+0, would also prevent floats then can create bias in the monetary aggregates, hence, fastening a better outcome in monetary policy decision by Bank Indonesia.

3.2 Payment System Oversight

As with other central banks, Bank Indonesia has a role to ensure the stability of the financial system, and maintains a very active and detailed supervision of banks (off site and on site supervision). The Bank Indonesia Act 1999 empowers Bank Indonesia to exercise the supervision and management of the National Payment System, though the Act is concerned largely with operational terms. Recently this has been extended to explicitly cover credit card issuers.

Bank Indonesia, guided by its core missions, responsibilities and authority, will supervise the payment system and its component systems necessary to minimise systemic risk and other concerns (crisis recovery, etc). This role could include the monitoring of payment system arrangements and the approval of payment system arrangements prior to their introduction.

Bank Indonesia is currently drafting the details of the regulation (Bank Indonesia decree) for the payment system oversight covering all aspects of the payment system. Presently, there is no specific procedure for market surveillance regarding the payment system oversight except for the oversight of the clearing system, which is managed by state banks which monitored "the black list" for the drawer of dishonoured Cheques or Bilyet Giro by banking supervision officer. Therefore, successful bank supervision implies low systemic risks and management of bank exposures to credit risks and liquidity risks at inter-bank level. Coordinating banking supervision policy and payment system supervision policy may require that Bank Indonesia should increase the scope of banking supervision to include payment system risks in the examination, assessment, monitoring and management of banks. In addition, banking supervision will need to be extended to include the licensing and subsequent examination of all payment system arrangements and operators maintained within Indonesia to ensure that all related payment system risks are appropriately monitored and managed.

A matter of great concern is related to money laundering. Bank Indonesia has just enacted on decree "Know your customer principles" which give provision to the banks to know their customer identity, oversight customer transactions and report to Bank Indonesia if there are any suspicious transactions. All these processes of making regulations and supervisions of the payment system could strengthen the stability of the financial system and give protection to the customers.

3.3 Competition/Innovation

Article 15 of the Bank Indonesia Act states that:
"Bank Indonesia shall, in regulating and safeguarding the smooth running of the payment system, be authorised as follows:

1. To implement, and grant approval and license and the arrangement of the payment service;
2. To require the operator of the payment system service to submit reports on its activities;
3. To determine the uses of payment instrument.

Article 17 states that:
The arrangement of the inter-bank clearing system shall be conducted by Bank Indonesia or other parties upon the approval of Bank Indonesia.

Therefore, Bank Indonesia is the sole provider of the clearing system and settlement services, through 102 local clearing houses either operating directly or, in smaller centres, the a State Bank acts as an agent.

Article 18 states that:
Bank Indonesia shall arrange the final settlement of inter-bank payment transaction both in rupiah and or foreign currencies.

The arrangement of the final settlement of the inter-bank payment transaction as referred to in paragraph (1) may be conducted by other parties upon the approval of Bank Indonesia. Bank Indonesia provides settlement services for commercial banks through accounts held in its 38 regional offices and an inter-regional on-line funds transfer service.

According to these rules, it seems that the clearing and settlement provider for Credit/Debit Note, Cheque/Bilyet Giro transactions should be conducted by Bank Indonesia (close system), except in the area that Bank Indonesia cannot provide such services.

Apart from these regulations, there are no specific legal provisions with regard to the entry into other payment system sectors such as switching company for ATM and EFT Pos, issuer/acquirer of credit card, etc. License for those kind activities could be obtained from Minister of Finance.

There are many classes of other institutions which participate in the payments system and which offer payment related services to other parties. These include Insurances Companies, Finance Companies, Telecommunication Companies, Couriers, Security Printers, etc.

In principle, the granting of a banking license represent an agreement between Bank Indonesia and the applicant that each applicant will abide by the terms and conditions of the license which confers the rights and obligations on the applicant. These arrangements confer the privileges, compliance costs, and responsibilities to the applicant to conduct their business in a prudential manner. If these conditions are not fulfilled, the central bank is empowered to take appropriate action to rectify matters. None of these regulations regarding the prudent conduct of business and concern for the core stability of the financial system and banking system are applicable to non-bank institutions. For these reason, non-bank institutions should be denied direct access to the payment system. Their participation in the payments system as financial agents should be restricted to the customer of reg-

istered banks. In particular, no non-bank should have any direct access or participation in either the clearings or settlement.

The increasing number of banks and economic recovery of the nation hastened the increased competitions among banks for the share of the financial market to meet the growing need of bank customers. This competitive environment and risk in the credit facilities (non performing loans) stimulate a greater efficiency and improved services to gain fee-based income. In this regards, many banks introduce many new payments system products such as ATMs with many payment features instead of only for withdrawal cash, credit/debit cards, POS, Electronic Fund Transfer, travelers cheque, deposit certificate and services such as phone banking and internet banking.

4. Consumer Protection

4.1 Payment System

There is no specific consumer protection regulation in regard to the Payment System Services in Indonesia. However, Indonesia has already in place the Consumers Protection Act No. 8/99 dated April 20, 1999. One of the reasons for the enactment of this act is to faster development of the national economy in an era of globalisation, which should support the growth of the business environment domestically and internationally. It should support the protection of a variety of goods and/or services with technological content and promote the welfare of the community at large and at the same time provide guarantee about the goods and/or services which are traded or transacted without inflicting losses to customer.

In this regard, customers should be cautious while choosing a particular service from the payment system provider by making comparisons (price, infra-structure, financial reports, etc) to avoid incurring of any losses.

As an administrative punishment for persons who drew a dishonoured cheques/Bilyet Giro, BI maintains a register of issuers of dishonoured cheques/Bilyet Giro called "Bank Indonesia Black List"; if three cheques/ Bilyet Giro are dishonoured within a six-month period or one dishonoured cheques/Bilyet Giro with amount more than one billion rupiah, the issuer is "blacklisted" and barred from holding a cheque or Bilyet Giro account for a period of one year.

Bank should closed its customer current account if it find his/her name on the black list for one whole year and moved the remaining funds (if any) to special saving account with priority to pay the incoming cheque/ Bilyet Giro. Banks are also obligated to take back the remaining blank cheque/Bilyet Giro book from customer to prevent from issuing another dishonoured cheque or Bilyet Giro that could lessen the public confidence in making payment using paper-based instrument.

4.2 Payment Services Provider

Apart from that, Bank Indonesia back in 1995 had already issued Bank Indonesia Decree No. 27/164/Kep/Dir dated March 31, 1995 on the "Use of Information Systems Technology By Bank" due to the stronger competition among banks which was fostered by the deregulation measures that were adopted by the government and consequently, the banking system has to constantly improve its efficiency and the quality of customer services. One way to achieve this objective is to use information systems technology (IST).

The reason for using IST is to improve efficiency in bank data processing, thus enabling the bank to provide accurate data on time while ensuring confidentiality. Nevertheless, it must also be understood that risk are inherent in IST, and that these risks, such as the dangers of misuse, losses and damages to data, could harm the bank and the public interests. To reduce these risks, bank management must adhere firmly to the principles of adequate control and security, and must also maintain the bank secrecy act.

But this decree only applies to banks and not to other institution that might also be providing payment system services.

5. Recent Payment System Development and Policy Initiatives

5.1 Electronic Inter-bank Clearing Systems

Bank Indonesia is currently implementing electronic inter-bank clearing as a component of a major payments system reform process. Jakarta Electronic Clearing System (SKEJ) is a system which "send first and match later" concept. The clearing data is sent to Bank Indonesia from the bank through the network and the paper can be send later. Based on this electronic data, Bank Indonesia will clear, settle and distribute the clearing result to the banks on the same day settlement cycle. The paper will be proc-

essed later and matches it with the electronic data. Any discrepancies will be subjected to adjustment by bilateral participant linkages.

In the near future, the Jakarta Electronic Clearing will be processing payment transaction electronically except for Cheques and Bilyet Giro that will still require paper/voucher for signature validation as regulated by the Commercial Code and Bank Indonesia regulation.

5.2 The Development of RTGS

After the implementation of the RTGS system in its head office, Bank Indonesia will gradually include the network of all Bank Indonesia regional offices into the RTGS environment. The integration of the BI-RTGS system in Bank Indonesia head office and its regional offices will bring about a centralised settlement account, in which all commercial bank accounts currently held in each Bank Indonesia regional office will be merged into one account held in one location, but can be accessed from any point in Indonesia.

The combination of accounts from these offices will benefit both Bank Indonesia and participating banks. It will lessen the burden of Bank Indonesia in monitoring bank compliance with the minimum reserve requirement. The combination of accounts can also be useful as an early warning system to monitor banks with liquidity problem. The bank participant, on the other hand can also monitor its liquidity position, so as to have some ways in managing its liquidity position.

In a bid to reduce the risk elements in the clearing system, Bank Indonesia is enacting the transaction cap regulation, which has already been implemented in early 2001. The Cap regulation will require all transactions with a nominal value of more than one billion rupiah to be processed through the RTGS system. Any transactions below one billion rupiah will be executed through the clearing system.

5.3 Medan Automated Clearing Upgrade

Bank Indonesia will upgrade the reader/sorter machine at its Medan branch to image basis system by the end of 2001. The upgrade is aimed at anticipating the increase of clearing volume in the city.

5.4 Bandung Clearing Automated Upgrade

As of December last year, the volume of notes in Bandung has been increasing significantly so that it can no longer be served by the local semi automated clearing system. This has driven Bank Indonesia to upgrade the system to the fully automated clearing system in anticipation of an increase in the volume of the clearing the city.

5.5 The Development of the Back-up Data Image in Bandung, Jakarta and Surabaya

To overcome the shortfall of the system both hardware and software which can not save data for more than 30 days, Bank Indonesia will optimise the application of data image technology that can increase the quality of the information, and remains cost efficient. For this purpose, besides Jakarta that has already implemented the CD burner system in its daily clearing operation. CD burner is expected to be implemented in other Bank Indonesia branches using the data image technology.

5.6 The Development of Bulk Inter-bank Payment System

The bulk payment system consist of routine payment among banks with high volumes but small nominal values such as payment transactions for credit cards, salaries, insurance and telephone bills, etc. Currently, many banks have already installed the bulk payment system, which enable their customers to carry out such transactions to debit their accounts automatically.

This process will ultimately reduce the operational costs of issuing the vouchers and in providing human resources and investment in machinery. The high volume of notes involved in bulk transaction payment has increased the burden of the reader sorter machine, which will slow down the settlement process. The process will be paperless where banks will deliver pre-prepared diskettes/magnetic tapes containing information of bulk payments for settlement. Bank Indonesia expects to install a special clearing for the bulk transaction by year-end 2001.

5.7 Back End Switch Implementation

To ensure the efficiency of the bookkeeping and switching processes at banks that have installed the automated teller machines in Indonesia, Bank

Indonesia will use moral persuasion to facilitate and to encourage the banks to integrate their network systems.

Currently there are 44 banks operating in total 3,584 Automated Teller Machines (ATM) as members of 7 (seven) domestic companies which are providing switching services (ALTO-PT. Daya Network Lestari (9 banks), ATM-Bersama-PT. Lintas Artha (15 banks), and ATM-BCA-PT. Rintis Sejahtera (3 banks), CAKRA-Bank Bali (2 banks), FLASH-PT. Lintas Artha (4 banks), CIRRUS-Master Card International (10 banks) and PLUS-Visa International (5 banks). The later is not connected which one another among the companies and 13 other banks operating independent ATM are also not connected either to the companies or each other among the 13 banks. With a view to increase the efficiency of the settlement process and to integrate the switching companies and banks, BI is persuading them to establish a national switching network by connecting their services to one another in 2001.

5.8 Development of Delivery Versus Payment (DvP) System

As a follow up to the RTGS development, BI is developing a DvP system between the RTGS and the securities settlement systems both in the Stock Exchange (for private paper) and in BI (for BI and government papers). The development is in the response to the need for payment settlement and securities delivery, which will be more timely and efficiency carried out to reduce the settlement risk in securities transactions.

5.9 Development of Remote Access Information System (RAIS)

Over the last five years, Indonesian banks have been making substantial investment in data communication networks and information system technology. While the general legal framework for electronic payments remained uncertain (under development), these banks are moving ahead with electronic/internet banking and payment services for their own customers which may be covered by specific contractual arrangements as provided for under the commercial code. To meet with this demand, Bank Indonesia is in the middle of developing RAIS for all banks in Surabaya as a pilot project and in several big cities in Indonesia. With RAIS, Bank Indonesia will broadcast all payment system information such as detailed balances of clearing outcome, circular letter, up dated bank code, etc, promptly after the processes have been done by Bank Indonesia. Banks could down load all information data provided by Bank Indonesia with on-line mode using tel-

ephone line (modem) and web browser application. As added benefits for this system, it could replace voice kit system, ensure fast delivery of clearing information, and banks could access directly the clearing result data from Bank Indonesia to debit/credit customer account instead of undergoing the tedious manually process today.

5.10 Development of Centralised Settlement Accounts (CSA)

Currently BI-Head Office and each BI-Branch maintain settlement accounts of banks operating in the same region as BI-Head Office and each BI-Branch. The banks holding their settlement account at the RTGS in BI-Head Office are banks' headquarter in Jakarta and banks' branch in Jakarta but their headquarter are located outside Jakarta. The banks holding their settlement accounts at a BI-Branch Accounting System are banks' branch with their headquarter either in Jakarta or another region and the banks' headquarter, if any, that operate in the same region as the BI-Branch.

In response to the need for banks to manage their cash/liquidity position more effectively and efficient and to assist BI in monitoring the inter-bank payment transactions on a national scale, BI is centralising the banks' settlement account in accordance with the RTGS. With CSA, BI-Branches will not maintain banks' settlement account at their Accounting System anymore, and there will be no inter-bank payment transactions being processed in 2 systems, i.e. at the RTGS and a BI-Branch Accounting System or vice versa but instead through BI-inter office transfer system, named SAKTI (Sistem Antar-Kantor Terotomasi dan Terintegrasi). The removal of inter-bank payment transactions settled in 2 systems through SAKTI will overcome related problems of money in transit which currently happens in settling inter-bank payment transactions with two related banks' settlement accounts maintained at two different BI accounting systems (at RTGS and a BI-Branch Accounting System).

6. Suggestions and Recommendations on the Role of Central Bank in Ensuring the Safety and Efficiency of the Payment and Settlement Systems

6.1 National Payment Council

It is recommended that National Payments Council (NPC) be formed to provide appropriate representation for all Payment System participants and Users and to provide direct assistance to Bank Indonesia in undertaking

many of the Payments System Development tasks within the overall direction and control of Bank Indonesia.

It is proposed that the National Payments Council should be established through Bank Indonesia decree and a separate legal body chaired by Bank Indonesia, with the following objectives:

- Monitors and reports to BI's Governor the developments in Indonesia's payment systems, to ensure overall payments system stability, efficiency and competitiveness;
- Fosters improvement to the payment system;
- Oversees legal, operational and technical connections between payment systems;
- Ensures the protection of consumer's interests; etc.

The members of the National Payments Council would include a Chairman from Bank Indonesia, representatives from the Bankers Association, Clearing House, Overseas Banks, Rural Banks, PT. Pos, PT. Telkom, Consumer interest, Non-bank Financial Institutions (including Finance Companies, Insurance Companies, Retailers), the Ministry of Finance, and other payments participants.

6.2 Banking Ombudsman

In an environment where thousands or millions of payments are processed every day, it is probable that errors will occur. One of the primary concerns in the design of a payment system is to ensure, in line with international recommendation, that accountability for payments forms a complete and auditable trail from payer to beneficiary, regardless of the instruments institutions, or processes used to effect payment.

It is not possible to foresee every payment problem that may occur, and incorporate remedies into the appropriate laws, regulations and industry agreements. Further, there may be cases where the bank and its customer disagree on the basic facts (for example, if an ATM fails to deliver cash, but the cardholder's account is charged anyway).

Both the Central Bank Act and the Banking Act rightly place considerable emphasis on maintaining confidence in the banking system. With the introduction of a wide range of new payment instruments and methods, particularly where some of these instruments are electronic, plastic, or otherwise "high tech", it is important that public confidence in the range

of payment instruments and the underlying payment systems should be reinforced through some independent enforcement agent in cases of dispute.

Banks (or Bankers Associations) in several countries have responded to this need for an independent body to rule on such matters, through the creation of a Banking Ombudsman who is in charged in fulfilling the role of an independent representative of consumer rights. Typically such a role carries the right to conduct investigations and to call banks to account for their actions in dealing with customers. The Banking Ombudsman can be petitioned by any bank customers to investigate any consumer complaint in any banking services.

It is recommended that Bank Indonesia should study the various Ombudsman Schemes, and consider the introduction of such a scheme in Indonesia as an integral institution within the payment framework. Some of benefits from establishing a Banking Ombudsman would include enhanced public confidence in the reformed payment system, and the new payment techniques, which are already being introduced by banks seeking to obtain the attention of the public for their services.

6.3 Effective Application of the Core Principles

Payment systems are at the heart of the financial sector. With the rapid changes in technology and competition in this sector, nationally and internationally, public policy needs to focus more systematically on encouraging safe and efficient payment systems at a national and international level.

The Core Principles are intended to be applied in all countries, within a realistic time scale, whether economies are developed, in transition or emerging. The particular way in which the Core Principles are used varies with the stage of economic development and with the economy's framework of institutions and infrastructure. They should be useful, however, both in making an initial assessment of payment systems, in continued monitoring of their safety and efficiency, and in designing reform projects. The report is addressed particularly to central banks and any other public agencies charged with responsibilities in this area, as well as to the private sector designers and operators of systemically important payments systems[3].

3. As recommended in the consultative report – "Core Principles For Systemically Important Payment Systems" Part 2 – Implementing the Core Principles, Bank for International Settlements July 2000.

Effective application of the Core Principles in the payment system area in Indonesia is essential for Bank Indonesia to achieve the public policy objectives in regard with overseeing and operating payment system (e.g. inter-bank clearing and RTGS systems). Therefore, Bank Indonesia should define clearly its roles and ensure that the Core Principles are applied to all systemically important payment systems in Indonesia.

Country Tables

Table 1. Major event affecting the payment and settlement systems in Indonesia

Date	Major Development
07 March 1967	First Clearing Arrangement in Jakarta (manually)
07 April 1990	Jakarta Automated Clearing House
06 January 1992	Surabaya Automated Clearing House
_____1992	First Clearing Arrangement by Computer (SOKL) in Jambi
11 January 1994	Medan Automated Clearing House
18 September 1998	Jakarta Electronic Clearing (On Line System)
17 November 2000	Bank Indonesia – Real Time Gross Settlement (BI-RTGS)

Table 2. Selected Country Indicators

	1995	1996	1997	1998	1999
Population (millions): Year end	194.7	197.9*	201.2*	204.5*	207.9*
GDP (Billion Rp)**	454,514	532,568	627,695	1,002,333	1,107,291
GDP per capita (Million Rp)**	2.3	2.7	3.1	4.9	4.3
Exchange Rate (against USD) ***					
Year end	2,308	2,383	4,650	8,025	7,100
Average	2,252	2,347	2,951	9,874	7,809

* Est. from 1995's population census times the average yearly population growth. Source BPS

** Current Prices

*** Source BI (Bagian APD)

Table 3. Settlement media used by non-banks (at year end)

	1995	1996	1997	1998	1999
Notes and coin (in Trillion of Rp)	23.7	26.2	33.5	48.3	72.5
Transferable deposits (in Trillion Rp)	31.9	41.6	49.9	59.8	66.3
Narrow money sup.(M1) (in Trillion of Rp)	52.7	64.1	78.3	100.5	124.6
Memorandum item: Broad money supply (M2/M3)	222.6	288.6	355.6	577.4	646.2

Table 4. Settlement media used by banks

	1995	1996	1997	1998	1999
Reserve balances held at central bank */	4,705	7,663	12,012	26,191	28,088
Of which:					
Required reserves	3,481	6,863	12,616	21,717	25,666
Free reserves	1,224	800	-604	4,474	2,422
Transferable deposits	n.a	n.a	n.a	n.a	n.a
Memorandum item: Institution borrowing from central bank	n.a	n.a	n.a	n.a	n.a

*/ Reserve balances using BI report, not banks' report. In 1995, reserve included cash in vaults.

Table 5. Institutional Framework (1999)

Categories	Number of institutions	Number of branches	Number of accounts	Value of accounts
Central Bank	1	41 (incl. Repr. Off)	n.a	n.a
Commercial: *Public* *Private* *Foreign & Joint*	 5 119 49	 5,304 4,167 93	n.a	n.a
Development and investment banks, rural banks (BPR): *Public* *Private* *Foreign*	n.a	9,384	n.a	n.a
Special Finance houses	245	n.a	n.a	n.a
Money Exchangers	733	1500	n.a	n.a
Post Office	1	26,000	n.a	n.a

Table 6. Cash dispensers, ATMs and EFTPOS terminals

	1995	1996	1997	1998*	1999
Cash dispensers and ATMs:					
Number of networks (year-end)				60	38
Number of Machines (year-end)	1,585	3,036	4,000	5,985	6,012
Volume of transactions (during)				171,801.969	408,766.065
Value of transactions (during) (Trillion Rp)	5.9	9.9	13.5	20.5	85.4
EFTPOS:	n.a	n.a	n.a		
Number of networks (year-end)				5	5
Number of Machines (year-end)				4,213	5,089
Volume of transactions (during)				1,935.631	2,951.558
Value of transactions (during) (Trillion Rp)				0.5	0.8

* Range of period April - Dec

Table 7. Number of payment cards in circulation (at year-end, in thousands)[1]

	1995	1996	1997	1998*	1999
Cards with a cash function				13,169	16,195
Cards with a debit/credit function[2]	n.a	n.a	n.a		
Of which					
Cards with debit function				5,374	12,110
Cards with credit function				2,657	2,895
Cards with a cheque guarantee function	-	-	-	-	-
Memorandum item: Retailer cards	n.a	n.a	n.a	n.a	n.a

* Range of period April - Dec

1. Most cards are multifunctional and may appear in several categories.
2. Overlaps with cards with a cash function.

Table 8. Payment instructions handled by selected payment systems: volume of transactions (in Thousands)

	1995	1996	1997	1998	1999
Bank Indonesia –RTGS	-	-	-	-	-
Cheques					
Credit transfer					
Giro System	-	-	-	-	-
Interbank Clearing House	n.a	107,789	111,270	87,342	78,090
Consists of : Cheque, Bilyet Giro, Debit Note and Credit Note					
Post Office:					
Postal money order	10,340.7	11,341.7	10,854.2	5,979.5	8,796.7
Postal cheques	8,183.5	9,326.5	9,918.5	10,636	11,163

Table 9. Payment instructions handled by selected payment systems: value of transactions

	1995	1996	1997	1998	1999
Bank Indonesia RTGS	-	-	-	-	-
Cheques					
Credit transfer					
Giro System	-	-	-	-	-
Interbank Clearing House	n.a	5,694	6,760	5,755	5,156
(Trillion.Rp)					
Consists of: Cheque, Bilyet Giro, Debit Note and Credit Note					
Post Office: (Million. Rp)					
Postal money orders	1,017100	1,115.00	1,241.00	822,28	1,618.90
Postal cheques	19,280.1	23,404.1	28,624.1	35,472.8	47,052.3

Table 10. Indicator of use of various cashless payment instruments: volume of transactions (thousands)

	1995	1996	1997	1998	1999
Cheques issued	n.a	n.a	n.a	n.a	n.a
Payments by cards					
Credit cards	n.a	n.a	25,000	15,394.8	29,578.1
Debit cards	n.a	n.a	n.a	11,934.9	16,000.0
Paperless credit transfers	n.a	n.a	n.a	n.a	n.a
Postal money orders	10,340.7	11,341.7	10,854.2	5,979.5	8,796.7
Postal cheques	2,452.5	3,140.55	3,340.6	3,201.6	2,862.3

Table 11. Indicator of use of various cashless payment instruments: value of transactions (Billion Rupiah)

	1995	1996	1997	1998	1999
Cheques issued	n.a	n.a	n.a	n.a	n.a
Payments by cards	n.a	n.a	n.a		
Credit cards				4,939	10,360
Debit cards				2,580	3.212
Paperless credit transfers	n.a	n.a	n.a	n.a	n.a
Postal money orders	1,017.0	1,115.0	1,241.0	822,28	1,618.9
Postal cheques	19,280.1	23,404.8	28,624.1	35,472.8	47,052.3

Table 12. Transfer instructions handled by securities settlement systems: volume of transactions (in millions shares)

	1995	1996	1997	1998	1999
Jakarta Stock Exchange					
Stocks	10,646.4	29,527.7	76,599.1	90,620.5	178,486,5
Bonds	n.a	n.a	n.a	n.a	n.a

Table 13. Transfer instructions handled by securities settlement systems: valued of transactions (in billions Rp.)

	1995	1996	1997	1998	1999
Jakarta Stock Exchange					
Stocks	32,357.5	75,729.8	120,385.1	99,684.7	147,879.9
Bonds	n.a	n.a	n.a	n.a	n.a

Source : Jakarta Stock Exchange Annual Report
Note : Figure does not include Surabaya Stock Exchange.

Table 14. Penetration of Payment Instrument

	1996	1997	1998	1999
1. Cash (in Trillions Rupiah)	26,2	33,5	48,3	72,5
2. Credit Card				
Number of Holders (in persons)	1,600.000	n.a	2,028.442	2,043.846
Volume of transactions (in thousands)	n.a	25,000	15,395	29,578
Value of transactions (in trillions Rp)	4.7	8.4	4.9	10.4
3. Debit Card				
Number of Holders (in persons)	945,400	1,000.000	5,374.376	12,110.970
Volume of transactions (in thousands)	n.a	n.a	11,935	16,002
Value of transactions (in trillions Rp)	0.3	0.3	2.6	3.2
4. Smart Card				
Number of Holders (in persons)	n.a	n.a	83,190	29,918
Volume of transactions (in thousands)	n.a	n.a	4,171	62
Value of transactions (in trillions Rp)	n.a	n.a	2.6	0.2
5. ATM				
Number of Machines (in units)	3,036	4,000	5,985	6,012
Number of Holders (in persons)	2,934.000	4,000.000	13,169.663	16,195.251
Volume of transactions (in thousands)	n.a	n.a	171,802	408,766
Value of transactions (in trillions Rp)	9.9	13.5	20.5	85.4
6. EFT/POS				
Number of Machines (in units)	n.a	n.a	4,213	5,089
Number of Holders (in persons)	n.a	n.a	46,652	53,322
Volume of transactions (in thousands)	n.a	n.a	1,936	2,952
Value of transactions (in trillions Rp)	n.a	n.a	0.5	0.8
7. Interbank Clearing*				
Instrument : Cheque, Bilyet Giro, Debit-Note, Credit Note				
Volume of transactions (in thousands)	107,789	111,270	87,342	78,090
Value of transactions (in trillions Rp)	5,694	6,760	5,755	5,156

Annex 2

List of Abbreviations

ATM	Automated Teller Machine
BI	Bank Indonesia
BIASA	Accounting Aplication System
BI-LINE	Bank Indonesia – Electronic Information and Transaction Service
BI-RTGS	Bank Indonesia Real Time Gross Settlement
EFT	Electronic Fund Transfer
FLI	Fasilitas Likuiditas Intrahari/ Intraday Liquidity Facility
KBI	Kantor Bank Indonesia/ Bank Indonesia Branch
MICR	Magnetic Ink Character Recognition
OKJ	Otomasi Kliring Jakarta/ Jakarta Automated Clearing System
OKM	Otomasi Kliring Medan/ Medan Automated Clearing System
OKS	Otomasi Kliring Surabaya/ Surabaya Automated Clearing System
OSA	Automated Accounting System
PBI	Peraturan Bank Indonesia/ Bank Indonesia Decree
POS	Point of Sales
Rp.	Indonesian Rupiah
SAKTI	Automated & Integrated Inter-Office Fund Transfer System
SKEJ	Sistem Kliring Elektronik Jakarta/ Jakarta Electronic Clearing System

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Chapter 2

THE PAYMENT AND SETTLEMENT SYSTEMS IN KOREA

by

Yu-Chul Kim*

1. Introduction

As in many other countries, the Korean payments system has been evolving from a system based almost exclusively upon cash and paper-based payment instruments towards an electronic payment system. The role of paper-based payment instruments in Korea, reflecting widespread use of cheques and bills, still remains significant. However, the volume of various types of electronic payment transactions has grown at an increasingly rapid rate since the mid-1980s as electronic banking has become widespread. Furthermore, the launch of the central bank's RTGS system for large-value interbank funds transfers, which was put into operation in December 1994, substantially transformed the structure of the Korean payment systems. As a result, electronic payment instruments made up about 58% by volume and 76% by value of all cashless payment instruments during 2000.

Participants in the payment and settlement systems in Korea comprise the Bank of Korea, which is in charge of final settlement as the central bank, financial institutions providing payment services, and the Korea Financial Telecommunications and Clearings Institute (KFTC), a clearing institution for retail payments.

The Bank of Korea performs various activities relating to the payment systems, including issuance of banknotes and coins, provision of current accounts for the settlement of interbank obligations, operation of RTGS system, and oversight of payment systems.

Banks provide various payment services for their customers such as issuance of cashier's cheques and credit cards; installation of CDs/ATMs

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for cash withdrawal and funds transfer based on demand deposits; and provision of other payment services such as bank giro credits and other interbank funds transfers. Other financial institutions such as the post offices, agricultural- and fisheries cooperatives, credit card companies also provide payment services.

The KFTC is responsible for the clearing of retail payments such as cheques and bills, CD/ATM transactions, etc. The KFTC is a non-profit organisation, which was set up in 1986 on a joint-ownership basis by member banks including the Bank of Korea.

There are a number of separate laws regulating various areas of the payment systems. Laws which stipulate the obligations and methods concerning the use of payment instruments are *the Civil Code of 1962, the Commercial Code of 1962, the Bills Act of 1962, the Checks Act of 1962, the Credit Card Business Act of 1987, etc.* There are also laws that provide for the institutional aspects of the financial institutions and cover the issuance of permit for the payment services which includes among *the Bank of Korea Act of 1950, the General Banking Act of 1950,* and special banking acts. Also, *the Framework Act on Informatisation promotion of 1995* supports development of financial information network and electronic banking systems.

2. Existing Payment and Settlement Systems

2.1 Domestic Payment and Settlement Systems

2.1.1 General Overview

The Korean payments system consists of one large-value fund transfer system, BOK-Wire, and 10 retail payment systems.

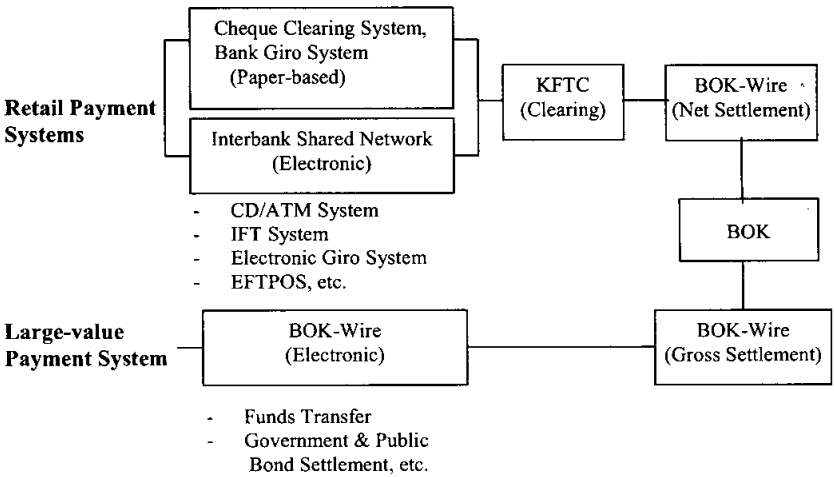
BOK-Wire is owned and operated by the Bank of Korea, the central bank in the nation. It is an on-line network that connects the BOK with the financial institutions to transfer funds in a real-time gross mode across their current accounts held with the BOK.

The retail payment systems in Korea are composed of the following: the Check Clearing System, the Bank Giro System and eight interbank-shared network systems. The interbank-shared network systems include:

- Interbank Cash Dispenser/Automated Teller Machine (CD/ATM) System
- Interbank Funds Transfer (IFT) System
- Electronic Funds Transfer at the Point of Sale (EFTPOS) System
- Cash Management Service (CMS) System
- Local Banks Network (BANKLINE) System
- Electronic Money (K-Cash) System
- E-Commerce Payment Gateway
- Electronic Banking Network System

Chart 1

Structure of Payment and Settlement Systems in Korea



The Korea Financial Telecommunications and Clearings Institute (KFTC), runs all of these retail payment systems. All retail payment transactions are cleared on a multilateral netting basis and finally settled at designated times on the next business days through BOK-Wire.

Table 1
Summary of Payment and Settlement Systems in Korea

System	Services	Owner	Introduction Date	Payment Type [1]	Settlement Day
BOK-Wire	Large-value interbank funds transfer	BOK	Dec. 1994	E	Real time
Cheque Clearing	Settlement of cheques, bills, etc.	KFTC	July 1910	P	T+1(T+2~3 between remote areas)
Bank Giro	Payment for insurance premiums, Utility fees, etc.	KFTC	Feb. 1977	E, P	T+2~3 (Payroll T+0)
CD/ATM	Cash withdrawal, In-house & interbank funds transfer	KFTC	July 1988	E	Beneficiary: Immediately Banks: T+1
IFT	Interbank funds transfer	KFTC	Dec. 1989	E	Beneficiary: Immediately Banks: T+1
EFTPOS	Payment for purchase	KFTC	Feb. 1996	E	Retailers: T+1 Banks: T+1
CMS	Large-volume & small-value funds transfer	KFTC	Aug. 1996	E	Withdrawal: T+0~1 Banks: T+1~2
BANKLINE	Inter-regional banks funds transfer	KFTC	June 1997	E	Beneficiary: Immediately Banks: T+1
Electronic Money (K-Cash)	Settlement of payment For purchase by K-Cash (electronic money)	KFTC	July 2000	E	Retailers: T+1 Banks: T+1
E-Commerce Payment Gateway	Payment for purchase through internet	KFTC	Oct. 2000	E	Retailers: T+1 Banks: T+1
Electronic Banking Network	Interbank funds transfer through home-, firm- & telebanking	KFTC	Mar. 2001	E	Beneficiary: Immediately Banks: T+1

1) P: Paper-based, E: Electronic

2.1.2 Payment Methods

2.1.2.1 Cash

Currently, The BOK issues banknotes in three denominations - W1,000, W5,000, and W10,000, and coins in six denominations - W1, W5, W10, W50, W100, and W500. At the end of 2000, the value of banknotes and coins issued to the public was about 18 trillion won.

In Korea, cash is widely used owing to its intrinsic convenience for small transactions and Koreans' traditionally strong preference for cash. From the early 1980s, however, the use of cash has declined following the introduction of new payment instruments including credit cards, bank giro, and other electronic payment media.

Table 2
Share of cash in M1

End of year	1980	1985	1990	1995	1998	2000
Cash/M1 (%)	48.8	43.5	44.1	38.7	38.4	37.5

2.1.2.2 Cheques and Bills

Cheques and bills are the most popular paper-based payment instruments. The total value of cheques and bills has increased in line with the expansion of the economy. Lately, however, the rate of increase has been faltering due to the recent expansion of electronic payments. In 2000, checks and bills cleared through clearing houses nationwide totalled 6,790 trillion won (approximately 6.0 trillion U.S. dollars) by value and 1,091 million by volume, which represented 24.3% by value and 30.8% by volume of all non-cash payments.

Various types of cheques and bills that are currently in use are as follows: cashier's cheques, current account cheques, household cheques, promissory notes, etc. Among these, cashier's cheques are most widely used like cash, because they can be cashed instantly at any bank and also because

the highest denomination of bank notes in Korea is 10,000 won, the worth which is less than 10 U.S. dollars. There are four types of preset-value cashier's cheques used in Korea, among which the 100,000-won denomination is the most popular as a substitute for bank notes. Cashier's cheques make up 98% of all cheques and bills cleared through the clearing houses, of this the 100,000-won denomination cashier's cheques make up 78%.

Current account checks and promissory notes are used mainly for business transactions by firms. Household cheques, namely personal cheques, were first introduced in 1981 to reduce the use of cash and to substitute cashiers cheques, but their use is decreasing significantly in recent years due to the development of electronic payment media as well as the issuer' default risks.

2.1.2.3 Funds Transfer

Funds transfer is a system whereby funds are transferred to a payee's account from the payer without any exchange of cash, bills, or cheques. Funds transfers also include credit transfers in which funds are transferred on the payment order of the payer, and direct debits in which funds are transferred on the payment order of the payee. In Korea, small-value funds transfers are executed through the Bank Giro System (for paper-based credit transfers, electronic direct debits, and automated credit transfers), the IFT System, the Interbank CD/ATM System, the EFTPOS System, the CMS System and the Interbank Electronic Banking Network System. Funds transfers are carried out through on-line corporate-banking and home-banking services provided through the telecommunication networks linking firms or homes and banks using host computers, personal computers, telephones, and terminals. Large-value funds transfers between banks are executed through BOK-Wire. In 2000, electronic funds transfers accounted for 75.6% of all non-cash payments by value and 58.3% by volume.

2.1.2.4 Cards

a. Credit Cards

Credit cards, which were first introduced in 1969, are among the most widely used payment media in Korea. Credit card holders not only can pay for purchases of goods and services but also borrow money instantly via CD/ATM. As of the end of March 2000, there were three bank-affiliated credit card companies and four specialised credit card companies. Most

credit cards can be used abroad through affiliation with VISA International or MasterCard International. As of the end of 2000, 36 million credit cards had been issued by bank-affiliated and specialised credit card companies.

b. Prepaid Cards

Prepaid cards were first introduced in September 1994. The maximum stored value of a prepaid card is 500,000 won. Prepaid cards such as telephone cards and public transportation (bus & subway) cards are very popular and widely used. In July 2000, a consortium of some banks, a credit card company and the KFTC has developed electronic money called K-Cash, which is legally a kind of multi-purpose prepaid card.

c. Debit Cards

Debit cards, which allow their holders to purchase goods and services in affiliated retail shops, were introduced in February 1996. EFTPOS is a network system that connects retail terminals to the computers of banks. Payment is automatically transferred from the cardholder's bank account to the retailer's.

2.1.3 Structure, Operation and Administration

2.1.3.1 Cheque Clearing System

Cheque Clearing, operated by the KFTC, is a system under which financial institutions within a certain area assemble at a clearing house and exchange debit instruments comprising bills, cheques, and other payment documents. The establishment of a clearing house requires the authorisation of the Minister of Justice as provided under the Bills Act and the cheques Act. The Seoul Clearing House, established in 1910, is the oldest and largest one in Korea. At the end of June 2001, there were 51 clearing houses in Korea.

a. Rules and Participants

The Board of Directors of the KFTC sets basic rules and the KFTC' Check Clearing Committee specifies operational procedures, except for the opening- and closing times which can be adjusted by each clearing house's steering committee. The Bank of Korea, being represented on the Board of Directors, takes part in the revision of the rules.

Major banks such as nationwide city banks, local banks and the Bank of Korea participate directly in the Cheque Clearing System while other small financial institutions do so indirectly through the direct participants. As of the end of June 2001, the Seoul Clearing House had 25 directly participating financial institutions (21 domestic banks, the Bank of Korea, two foreign bank branches, and the Post Office) and 1,523 indirectly participating financial institutions which include most of the foreign bank branches and the agricultural- and fisheries cooperatives.

b. Operation of the System and Settlement Procedure

In Seoul area, all participating banks should submit cheques and bills, which are payable at other banks, to the clearing house within two hours after the closing time of each business day, for overnight clearing. However, if a participant has its own reader-sorter, it may send the cheques and bills later that night after sorting them by the machine. At the clearing house, most cheques and bills are automatically read and sorted by reader-sorter machines. Also in Seoul area, cashier's cheques are not delivered to the issuing banks as a result of an electronic cheque truncation, which was implemented since May 2000, to reduce the burden of physical delivery of the paper-based payment instruments.

In local area, however, interbank cheque clearings begin at around 8:00~9:00 a.m. in the morning of the next business day and all cheques and bills including cashier's cheques are exchanged manually.

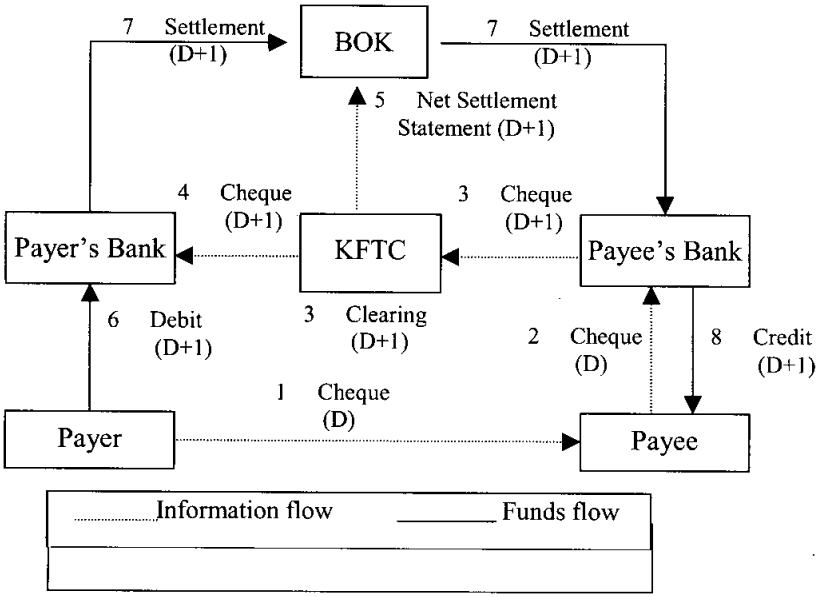
The final stage of daily clearing is when the KFTC requests the BOK to credit and debit the multilateral net positions to the current accounts held by participating banks at the designated time, 2:30 p.m. (1:00 p.m. on Saturdays).

Chart 2 shows the typical settlement process for cheques.

c. Inter-regional clearing

Mutual clearing between neighbouring clearing houses has been carried out since March 1977, and eight major cities including Seoul act as regional centers in mutual clearing arrangements. This mutual clearing, which is based on agreements between neighbouring clearing houses, permits more rapid settlement of bills and cheques than the time-consuming collection method by which bills and cheques are exchanged directly between distant branches.

Chart 2
Settlement Process for Cheques



d. Sanctions against Drawers of Dishonored Bills and Cheques

The KFTC requires that participants should apply sanctions by holding all current account transactions by drawers who have failed to honour bills and cheques that have been legally presented (e.g., due to insufficient funds). An individual or a legal entity subject to such a sanction were not be allowed to undertake current account transactions with any participant bank for two years thereafter. However, he/she may resume the current account transactions if his/her credit is restored through the payment of all outstanding bills and cheques or if there are other good reasons for allowing him/her to do so.

e. Pricing Policies

Participants in the Check Clearing System must pay quarterly fees to share the operating costs of the KFTC based on each participant's volume and value of cheques and bills cleared during the quarter. Banks charge their

customers collection fees for the cheques and bills payable at the clearing houses located in the different cities.

f. Management of Risks

The Cheque Clearing System has a set of risk management arrangements to make sure the timely finalisation of its multilateral net settlement. In the event that a participant fails to meet its obligation to pay at the designated time (2:30 p.m., 1:00 p.m. on Saturdays), it shall be fined as much as 500,000 won. Second, if it finally defaults at the end of the day (4:30 p.m., 1:30 on Saturdays), the KFTC may eliminate all the cheques and bills received by- and presented to the failed bank so as to unwind the multilateral net positions. Third, the failed bank shall be excluded from the cheque clearing, beginning on the next business day. In practice, however, only the first measure has been taken so far.

2.1.3.2 Bank Giro System

The Bank Giro System, which was introduced in February 1977, enables payments of various kinds to be safely and conveniently executed by direct transfers of funds between bank demand deposit accounts rather than through the exchange of cash or cheques. This allows any individuals, corporations or non-profit organisations to make use of all bank branches as paying or receiving windows, while preventing the loss or misappropriation of funds sometimes associated with the direct payment of cash.

a. Rules and Participants

The operation of the Bank Giro System is governed by the KFTC's rules, which are formulated by the Board of Directors and the Giro Committee of the KFTC and made up of delegates of the participants. The Bank of Korea, being represented on the Board of Directors, takes part in the revision of the rules.

As at the end of June 2001, there were twenty-five participants including 21 domestic banks, one foreign bank branch, the Post Office, and the Agricultural and Fisheries Cooperatives. The users comprise 34,693 institutions, such as companies and government agencies, and the number is expected to increase steadily. In order to become a user of the bank giro service, prior permission has to be obtained from the KFTC.

b. Types of Transactions Handled

The Bank Giro System consists of a paper-based credit transfer system and an electronic funds transfer system. Paper-based credit transfers are mainly used to collect installment sales payments, insurance premiums, membership fees, local government taxes, etc. The Bank of Korea encourages paper-based credit transfers to be substituted by electronic credit transfers, which have similar affects to that of cheque truncation.

Types of giro transactions using electronic methods include direct debits, direct credit transfers, and standing orders. Direct debits allow recipients of large numbers of payments, such as public utilities, insurance companies and credit card companies, to collect payments automatically from a bank account after the account holder has authorised his/her bank to pay either a regular fixed sum or variable amount. Direct credit transfers are used for making payments to a large number of recipients such as those on a company's payroll. Payers such as major corporations and government agencies are able to credit individual employees' bank deposit accounts simultaneously using this type of transfer. Standing orders are mainly used for regular payments such as repayment of bank loans and contributions to charity organisations etc.

c. Operation of the System and Settlement Procedure

When the KFTC has processed a giro transaction, it supplies the payment details on a magnetic tape or a floppy disk to the payee's bank. The payment details are also delivered to the payee directly. The detailed procedures are as follows:

A paper-based credit transfer is initiated when a customer pays a bill with giro account number printed on it at a bank. After closing daily business, the bank sends the bills paid during the day to the KFTC by post or by cheque clearing transport on the same day. The KFTC then classifies the bills by giro account number, calculates the total amount due, and sends a credit advice to each payee's bank. In the case of a bill with OCR (optical character recognition), the KFTC then sends those bills with receipt details to the respective payees on magnetic tapes, while in the case of a bill with MICR (magnetic ink character recognition) on it or any other bills with giro account number, it sends the magnetic tape together with the paper document. Currently, there are two processing centers for paper-based credit transfers in Korea, one in Seoul and the other in Pusan.

Direct debits start when the KFTC receives a debit notice in the form of a magnetic tape or a floppy disk from the receiving institutions at least three days before the due date. The debit notices are classified and grouped according to paying bank, and debit orders are sent to the banks by the KFTC. Provided sufficient funds are available, the bank debits each amount to be paid from the appropriate deposit account on the due date and notifies the KFTC accordingly. The amount is credited to the recipient's deposit account in accordance with the debit details.

Direct credit transfers start when the KFTC receives payment details on a magnetic tape or a floppy disk at least three days before the due date. It classifies them by the recipient's bank and draws up the credit details for each recipient, and then sent them to recipient bank's head offices. Each bank then credits the funds to the accounts of the respective payees electronically.

A standing order transaction is initiated when the funds involved are debited automatically from a payer's account one day before the due date, and the payer's bank transmits the relevant data to the KFTC by file transfer. The KFTC classifies the data by receiving bank and transmits them to the banks concerned before the start of business day on the due date. The funds are credited to the payee's account on the same day.

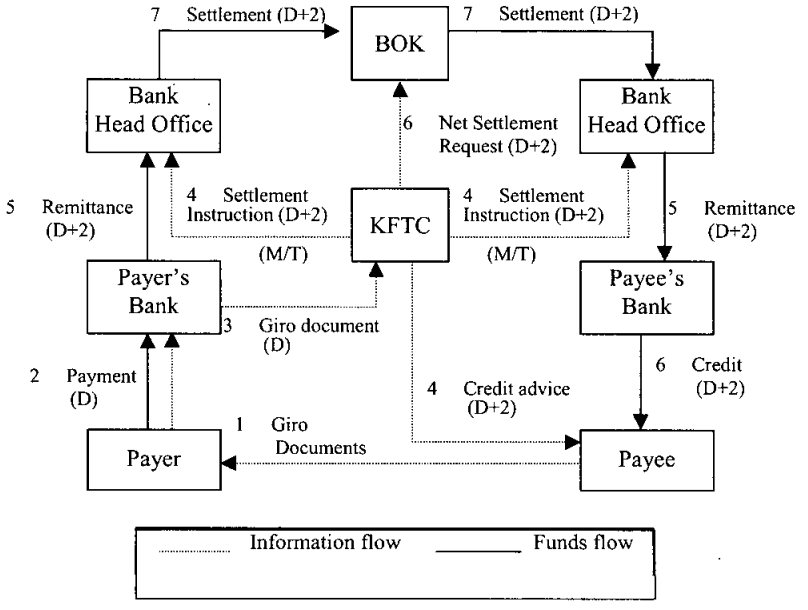
Paper-based credit transfers take two or three working days from presentation of the funds transfer instruction by the payer until funds are credited to the payee's account. Direct debits and direct credit transfers require three working days before the payee can withdraw the funds. Standing orders are executed for next day value. The payee can withdraw funds as soon as they are credited to his bank account, but interbank net settlement is finalised at 11:30 a.m. that day through banks' current accounts held with the Bank of Korea. Data on the net settlement positions are sent by the KFTC to the Bank through BOK-Wire and to participating banks via the computerised telecommunication network.

Chart 3 shows a typical paper-based credit transfer process

d. Pricing Policy

Fees for bank giro services, set by the Board of Directors of the KFTC, are relatively low compared to those of other means of remittance. They are levied by the banks on their corporate customers (individual customers

Chart 3
Process of Paper-based Credit Transfer



are not charged). They range from 120 won to 400 won per transaction for paper-based credit transfers, and 30 won to 50 won for direct debits. Fees for direct credit transfers and standing orders have already been deregulated and other fees will also be deregulated in the near future.

e. Management of Risks

In this system, participant banks are not exposed to credit risk since customer's accounts are credited immediately after the completion of interbank settlements while liquidity risk remains. The Bank of Korea requires all the participants to pledge a collateral equal to 30% of average net debit positions during the previous six months. In the event that a participant fails to meet its obligations, the BOK can sell the collateral or use it as a collateral for extending loans in order to raise funds to cover the deficiency. If the value of collateral pledged by the failed bank is not sufficient to cover it, a loss sharing can take place in proportion to each participant's composition of total collaterals.

2.1.3.3 Interbank Funds Transfer (IFT) System

The IFT System, which was brought into operation in December 1989, is an electronic funds transfer system that allows nationwide remittances to an account held at any branch of a participant bank on a real-time basis by interconnecting participating banks' computers through the KFTC's switching computer. A customer can use any bank, whether or not he/she holds an account with it, for the transfer of funds to a payee holding an account at any bank. The remitting bank makes a funds transfer to the payee's account in real-time through the IFT system network. Funds transfers are made on a 'single-payer-to-single-payee' basis, in contrast to the 'from-one-to-many' or 'from-many-to-one' basis in the Bank Giro System.

a. Rules and Participants

The rules for the operation of the IFT System are established and revised by the Board of Directors of the KFTC. The Bank of Korea, one of whose Assistant Governors sits on the Board of Directors, is involved in the establishment and revision of the rules. The rules provide for such matters as participants' obligations, data processing procedures, and settlement of balances. As at the end of June 2001, 29 financial institutions including all domestic banks, three foreign banks, the Post Office, and Agricultural and Fisheries Cooperatives were participating in the IFT System, for which the KFTC acts as the relaying center.

b. Types of Transactions Handled

This system handles interbank funds transfers and cashier's cheque enquiries. The funds transfer services can be used up to a ceiling on remittances of 100 million won (approximately 80,000 U.S. dollars) per transaction. Cashier's cheque enquiry is a service whereby a bank, at the request of a customer, is able to provide information on the status (issued or unissued, honoured or dishonoured, etc.) of cashier's cheques, after making enquiries at the issuing bank through the IFT System.

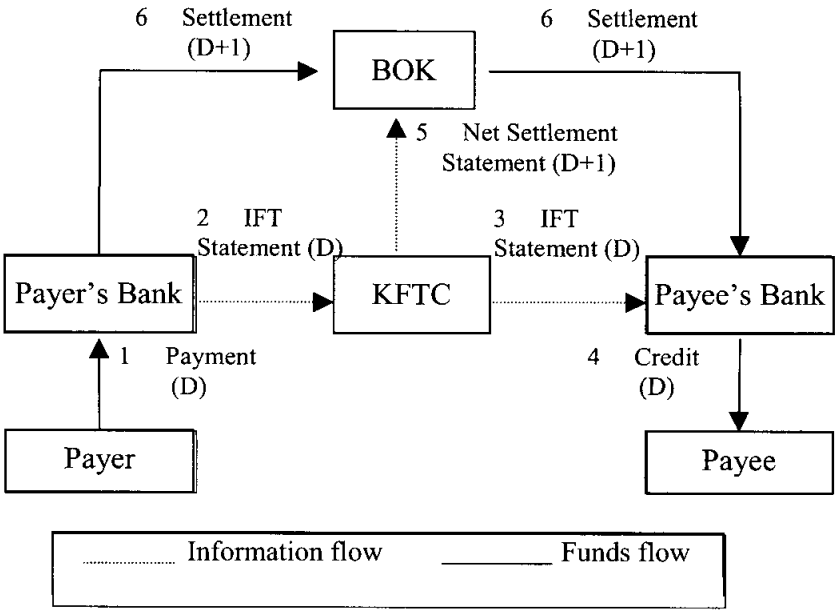
c. Operation of the System and Settlement Procedure

A funds transfer is initiated by a payer's request to his/her bank in the form of a remittance slip. A payment instruction is sent to the KFTC, which in turn transmits the instruction to the payee's bank. Upon receiving the instruction, the payee's bank credits the payee's account. Under this

system, the payment instruction is in principle irrevocable, although a transaction conducted in error by a sending bank may be revoked within that day. The IFT System is available between 9:30 a.m. and 4:30 p.m. (1:30 p.m. on Saturdays), which corresponds to banking hours. A payee can withdraw funds once they have been credited to his/her bank account, but settlement between the banks involved is finalised by debiting and crediting their accounts with the Bank of Korea at 11:30 a.m. on the next business day through BOK-Wire. The KFTC calculates the multilateral net positions of participant banks and transmits the details on-line in tabulated form to the Bank of Korea and the individual banks.

Chart 4 shows a typical IFT process.

Chart 4
Process of IFT



d. Pricing Policy

Fees for use of the Interbank Funds Transfer network have been deregulated since April 1994, and participant banks charge their customers at their discretion on the basis of the remittance amount and the location of the payee.

e. Management of Risks

In this system, the participant banks are exposed to credit risks and liquidity risks because funds transfers between customers' accounts are carried out in a real time basis, whereas settlements between the customers' banks are made by multilateral netting basis at a deferred designated time, i.e. 11:30 a.m. on the next business day. Therefore, this system has a set of risk management arrangements to prevent systemic risk. They include net debit caps, collateralisation and loss sharing. Net debit caps are set by participants considering their past settlement records etc., but they must pledge collaterals equal to 10% of their net debit caps. Details of the use of collaterals and loss-sharing principle are the same as mentioned in describing the Bank Giro System.

2.1.3.4 Interbank CD/ATM System

In Korea, cash dispensers (CDs) have been installed by individual banks since 1975 and automated teller machines (ATMs) since 1984. The Interbank CD/ATM System was launched in July 1988 in order to permit joint use of the computer resources of all banks. Customers can use the CDs and ATMs of any bank to make cash withdrawals or funds transfers. Since September 1995, the operation of CDs/ATMs installed in "cash corners" (unmanned automatic centers) and public places other than bank premises has been allowed between 8:00 a.m. and 10:00 p.m. seven days a week.

a. Rules and Participants

The CD/ATM Network is operated according to rules, which are established and revised, by the Board of Directors and the Electronic Banking Committee of the KFTC. The role of the Bank of Korea with regard to this system is the same as in the case of the IFT System. As at the end of June 2001, 26 banks including two foreign banks, the Post Office, and member cooperatives of the Agricultural- and Fisheries Cooperative Federations were participating in the Interbank CD/ATM System.

b. Types of Transactions Handled

This system handles cash withdrawals, enquiry of deposit balances and funds transfers. Not only cash card holders but credit card holders also can withdraw cash from the CDs/ATMs since September 1993, and funds transfers were added to the range of services in February 1994. A customer may also withdraw funds in the form of cashier's checks, but only through the CDs/ATMs of a bank where he holds an account.

c. Operation of the System and Settlement Procedure

When a customer holding a cash card uses a CD/ATM, a message is transmitted electronically to the issuing bank through the KFTC's switching computer. The issuing bank, after verifying the payment instruction, sends a message to the customer via the KFTC, enabling the customer to complete the transaction. Interbank funds settlement in this system is completed on a net basis at 11:30 a.m. on the next business day, by debiting and crediting the individual banks' current accounts held with the Bank of Korea through BOK-Wire. The KFTC calculates the multilateral net positions of participating banks and transmits the details on-line in tabulated form to the Bank of Korea and the individual banks.

Chart 5 shows a typical CD/ATM transaction flow.

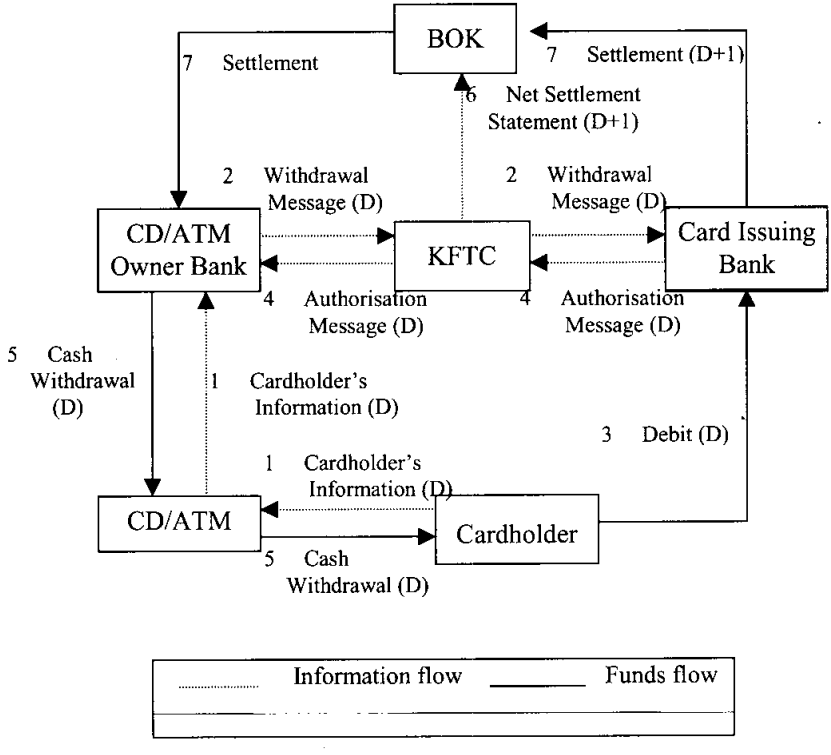
d. Pricing Policy

As to the participant's fees to the KFTC and banking charges for customers, the same rules are applied as mentioned in the section describing the IFT System.

e. Management of Risks

This system's risk management arrangements are exactly the same as those applied to the IFT System i.e. net debit caps, collateralisation and loss sharing.

Chart 5
Process of Cash Withdrawal through CD/ATM



2.1.3.5 Electronic Funds Transfer at the Point of Sale (EFTPOS) System

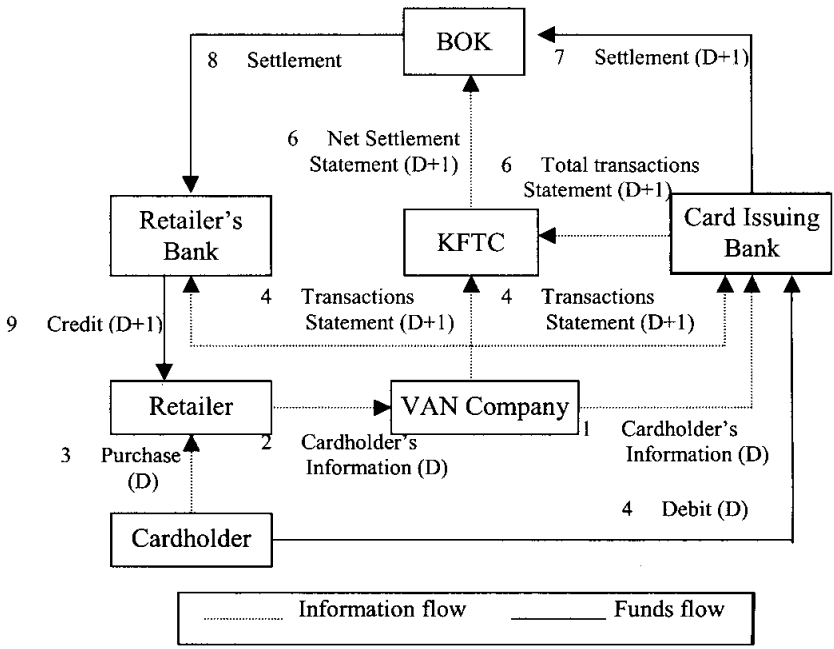
The EFTPOS System was launched in February 1996 as an interbank network system to encourage the wider public use of electronic payment media, which may eventually replace cash payments for the purchase of goods and services at retailers. As at the end of June 2001, the participants in this system were 20 banks and six VAN businesses including the KFTC.

The EFTPOS System enables a debit-card holder to purchase goods and services from any affiliated retailers. The cardholder's bank account is instantly debited at the point of sale through an EFTPOS terminal linked to VAN service providers and banks. Limits are set on the amount that a

cardholder can spend: 500,000 won (approximately 450 U.S. dollars) per transaction and 1,000,000 won (approximately 900 U.S. dollars) per day. The affiliated retailers should pay a small percentage (1/2 percent) of the amount of each sale for utilisation fees, which are divided between the card issuers and the VAN service providers. When a debit-card holder purchases goods and services from an affiliated retailer between 8 a.m. and 10 p.m. during any day including holidays, the customer's account is instantly debited. The next morning, the VAN service providers send the trade information to the KFTC by magnetic tape or on-line. The KFTC calculates the interbank netting positions and these are settled across the banks' current accounts held with the Bank of Korea at 11:30 a.m. through the BOK-Wire. After interbank settlement has been completed, the bank transfers the relevant funds to the affiliated retailer's account on that same day.

Chart 6 shows a typical debit card payment network.

Chart 6
Process of EFTPOS



2.1.3.6 Cash Management Service (CMS) System

The CMS System was introduced in May 1996 as one of the interbank network systems in an effort to provide on-line services for multi-banking report service and to facilitate large-volume & small value funds transfers. This system enables a company having several accounts in more than one bank to make and receive a number of funds transfers electronically through its accounts, and to produce multi-banking reports with a single electronic link to any one of participating banks or the KFTC, which acts as a communications center.

As at the end of June 2001, participants in this system were 25 banks. Customer's fees for using the CMS System are freely set by individual bank, and the Board of Directors of the KFTC determines how to allocate the customer's fees among banks related to funds transfer services and multi-banking report services.

2.1.3.7 BANKLINE System

The BANKLINE System, an inter-local bank network introduced in June 1997, interlinks the switching computer of the KFTC and the computers of the local banks. This system enables the customers holding a BANKLINE passbook, developed jointly by the local banks to withdraw cash from their accounts at any local banks and remit funds to any other local banks. Since customers get an access to all branches of local banks across the country, the system is very useful to those who travel in various areas of the country or move from one rural area to another.

2.1.3.8 Electronic Money (K-Cash) System

The Electronic Money (K-Cash) System was established in July 2000 to clear interbank settlement obligations arising from the purchase of goods and services using K-CASH, e-money developed by the consortium of 11 domestic banks and one credit card company. K-CASH is a kind of prepaid card with integrated circuit chip and can stores a maximum of 200,000 won. The Electronic Money System enables retailers to collect the sales proceeds paid by K-Cash electronically regardless of who the issuing bank is.

2.1.3.9 E-Commerce Payment Gateway System

E-Commerce Payment Gateway is a mediation system for payment or funds transfers that occur in electronic commerce through the Internet. In this system, on-line payment services for B2C transactions are provided by linking cyber shopping malls, vending companies, banks, a clearing center and a certification authority. Available payment methods are credit card and on-line remittance. This system was put into operation in October 2000. As of the end of June 2001, 19 financial institutions were participating in the system.

2.1.3.10 Electronic Banking System

The Electronic Banking System was established in April 2001 to settle interbank funds transfers and to exchange financial information through pc banking, telebanking and Internet banking. Before the establishment of the Electronic Banking System, interbank funds transfers by means of pc communication, telephone and Internet were carried out through the Interbank Funds Transfer System (IFT) or the CD/ATM System. Therefore, the availability of electronic banking had been limited to the operation times of the IFT and CD/ATM Systems. To address this problem, the Electronic Banking System that operates 24 hours a day, 7 days a week was introduced.

The ceiling for funds remittances is 500 million won (approximately 400,000 U.S. dollars) per transaction. The system also enables customers to inquire about their deposit balances and to obtain details of their credit card payments or of transactions made through their accounts. As of the end of June 2001, there were 26 participants including 21 domestic banks, two foreign banks, the Post Office, and the Agricultural- and Fisheries Cooperatives.

2.1.3.11 The Bank of Korea Financial Wire Network (BOK-Wire)

The Bank of Korea's RTGS system, named The Bank of Korea Financial Wire Network or BOK-Wire, was put into operation in mid-December 1994. BOK-Wire is an on-line network, which interconnects the central bank with financial institutions. Through BOK-Wire, large-value funds transfers among these institutions are electronically executed and settled by adjustment of their current accounts held with the Bank of Korea.

The globalise financial markets brought about by rapid advances in telecommunications and information technologies require sound and well-functioning payment and settlement systems. Therefore, improvement of payment and settlement systems has been one of the most fundamental tasks facing central banks as the lenders of last resort.

On the basis of this perspective, in March 1987, the Bank of Korea decided to construct its own electronic interbank funds transfer network, as the backbone of the nation's financial infrastructure. The decision was taken in response to moves toward building central bank financial networks in major advanced countries, and also in order to handle the dramatically increasing volume of payments occurring in the process of financial deregulation and internationalisation. In December 1990, the Bank organised a task force and started the program's development. After four years of coordinated efforts, construction of the network was finally completed in December 1994, when BOK-Wire's operation began.

a. Rules and Participants

The primary legal basis for the operation of BOK-Wire is The Bank of Korea Act. Article 81 of the Act stipulates that the Bank of Korea shall engage in the operation and management of the payment systems insofar as this is related to monetary and credit policies. The Monetary Policy Committee of the BOK, whose prime function is to formulate and implement monetary and credit polices, issued in August 1994, the Regulation on the Operation of BOK-Wire. This Regulation governs the principal policies related to operation of BOK-Wire, such as access, operation, pricing, risk management, security and so on. The Governor of the Bank of Korea formulates detailed operation rules necessary for the enforcement of the operation policies. In addition, the Bank of Korea enters into a basic Agreement on Admission to BOK-Wire with each participant, in order to clearly define the rights and obligations of the system operator and those of the participants. The Bank of Korea also makes an Agreement on Net Settlement with the participants in the multilateral net settlement system for retail payments.

Any financial institution, holding a current account with the Bank of Korea, whether a bank or a non-bank, is eligible to participate in BOK-Wire subject to the Bank of Korea's approval. The participants in the system are banks, including most foreign bank branches, and non-bank financial institutions such as securities companies, insurance companies, and merchant

banking corporations. As of the end of June 2001, the number of participants was 132, of which 66 were banks and 66 were non-bank financial institutions.

b. Types of Transactions Handled

The main service provided through BOK-Wire is domestic currency funds transfers. In addition to this, foreign currency funds transfers, government and public bonds transactions, Bank of Korea loans and discounts, and central government treasury funds transfers are also carried out through other subsystems of BOK-Wire.

The Domestic Currency Funds Transfer System executes funds transfers between participants and between banks' head offices and their main local branches (in-house funds transfers) for various purposes across counterparts' current accounts with the Bank of Korea (the main local branches maintain separate current accounts at the Bank's local branches). It also deals with the settlement of call transactions between participants, the settlement of net positions resulting from the Cheque Clearing, Bank Giro, and IFT Systems, and the settlement of bonds transactions in the over-the-counter market. Firms and individuals can make use of BOK-Wire for large-value (minimum 1 billion won, equivalent to about 0.8 million U.S. dollars) funds transfers by means of third-party funds transfer through a BOK-Wire participant bank.

The Bank of Korea Loans and Discounts System handles file transfers and settlements related to the Bank's loans and discounts to banks. In addition to the on-line funds transfer function for loans and discounts and their repayment, the system can automatically screen the eligibility of each bank's loan application documents using its file transfer processing function. A participating bank can use the network to report the total volume of its loans and discounts, which is used as the basis for the credit line provided by the Bank of Korea. Banks can also register various kinds of relevant information on firms in connection with the Bank's loans and discounts.

The Treasury Funds Transfer System carries out file transfers and settlements related to the Bank's disbursement and receipt of central government treasury funds via the Treasury agencies, which are the head offices and designated branches of banking institutions. The Treasury funds to be disbursed to or received by a Treasury agency using its current accounts with the Bank of Korea are, in principle, settled at a designated time.

The Government and Public Bonds System provides BOK-Wire participants with book-entry services related to issuance, registration, transfer, repurchase, and redemption of government bonds and the BOK's Monetary Stabilisation Bonds between the BOK and financial institutions. Payments of these bond transactions are made on a delivery-versus-payment (DvP) basis to avoid settlement risk.

The Foreign Currency Funds Transfer System handles foreign currency funds transfers between participants including the foreign banks currency accounts used by book held in its account. The system currently provides transfer of US dollars and Japanese Yen only. It is mainly used for deposit and withdrawal of the required reserve for foreign currency deposits of the banks' customers. It also deals with settlement of the US dollar leg in Korean won/US dollar transactions between domestic banks. The final settlement of US dollars is made in the US payment system through US correspondent banks.

c. Operations

Each participant key in each payment instruction using its terminal connected with BOK-Wire, and each payment is debited from the payer's account and credited to the counterpart's account. Once funds transfers are settled using BOK-Wire, they are irrevocable and unconditional. If a payment is made in error, the payer therefore has to ask the recipient to carry out an offsetting transaction.

Payment instructions, which cannot be executed due to insufficient current account balances, are channeled into a queuing file until their balances are covered. When there is sufficient balance in place, the queued funds transfer is executed and settled on a by-pass FIFO (First-In, First-Out) basis. This enables the BOK-Wire system to execute subsequent payment orders in the queue automatically whenever the account balances are sufficient to cover funds transfers, making an exception to the FIFO principle by leaving in the queue unsettled first-in large value payment orders that exceed the balance. It is possible for the participants to cancel the payment orders in the queuing file.

All payments are basically settled on a gross, trade-by-trade basis. However, BOK-Wire has also introduced pre-fixed designated-time settlement to give participants more flexibility in managing their funds during the day, thus ensuring smooth settlement operations through BOK-Wire. Designated-

time settlement is mainly used for the settlement of multilateral net positions arising from the retail payment systems such as Cheque Clearing, CD/ATM, Bank Giro, etc. Basically, BOK-Wire has two designated times for these settlements during a day, one at 11:30 a.m. and the other at 2:30 p.m. Table 3 shows more detailed information on designated times by type of transaction.

The on-line business hours of BOK-Wire are 9:30 a.m.~5:30 p.m. from Monday to Friday and 9:30 a.m.~1:30 p.m. on Saturday. For more efficient operation, however, deadline for participants' keying in funds transfer instructions is set as 5:00 p.m. (1:30 p.m. on Saturday). The Bank of Korea can extend the operation hours of BOK-Wire if necessary.

Table 3
Designated Times for Settlement through BOK-Wire

	Type of Transaction	**Monday-Friday**	**Saturday**
Net Settlement	Cheque & Bill clearing	14:30	13:00
	Bank Giro, CD/ATM, IFT, EFT/POS, CMS, etc.	11:30	11:30
Central government treasury funds Receipt and disbursement		14:30	13:00
Call-money Borrowings	Morning half-day call	11:30	11:30
	Afternoon half-day call	14:30	13:00
Call-money Repayments	Morning half-day call	14:30	13:00
	Afternoon half-day call	16:30	13:30
	One-day or longer- period call	14:30	13:00
Advance funds transfer		14:30	13:00

d. Pricing Policy

Participants in BOK-Wire pay fees determined by the Bank of Korea, based on their usage. Fees are levied per transaction: 150 won (about 12 U.S. cents) for a funds transfer until 2:30 p.m., 250 won (20 U.S. cents) after 2:30 p.m. and 500 won (40 U.S. cents) for the cancellation of a pending transaction.

e. Transactions Turnover

Daily average funds settlement value through BOK-Wire is about 64 trillion won (about 50 billion U.S. dollars) and amounted to 75% of the total value of non-cash settlements in Korea in 2000. Table 4 shows more information on settlement turnover through BOK-Wire.

Table 4
Use of BOK-Wire
(Daily average)

	1997	1998	1999	2000
Volume (Unit: number)	**5,053**	**4,781**	**4,694**	**4,767**
Domestic Currency Funds Transfers	4,289	4,100	4,064	4,092
(Gross settlement)	*(3,099)*	*(3,051)*	*(3,208)*	*(3,299)*
(Net settlement)	*(1,190)*	*(1,049)*	*(856)*	*(793)*
BOK Loans and Discounts	103	73	43	37
Central Government Treasury Funds	644	576	578	625
Government and Public Bonds	17	32	9	13
Foreign Currency Funds Transfers	17	19	13	10
Value (Unit: billion won)	**32,191**	**47,954**	**67,032**	**63,867**
Domestic Currency Funds Transfers	30,922	44,135	64,754	61,077
(Gross settlement)	*(22,146)*	*(34,479)*	*(51,499)*	*(48,962)*
(Net settlement)	*(8,776)*	*(9,656)*	*(13,255)*	*(12,115)*
BOK Loans and Discounts	471	814	748	637
Central Government Treasury Funds	598	652	1,012	1,459
Government and Public Bonds	200	2,353	518	694
Foreign Currency Funds Transfers (Unit: million U$)	305	309	390	97

f. Risk Management

BOK-Wire is a real-time gross settlement system, which does not basically entail settlement risk. Nevertheless, the failure of a large bank to meet its payment obligations could have knock-on effects on other participants. The Bank of Korea has introduced an intraday overdraft facility, a half-day call transaction system, an advance funds transfer arrangement, and a designated-time mechanism to minimise the effects of unexpected and temporary liquidity shortages of participants in BOK-Wire.

To induce smooth settlements among participants, the intraday overdrafts facility was introduced on a collateralised basis in 2000. The Bank of Korea advances an intraday overdrafts facility with no interest, to a bank participant, which falls short of temporary settlement funds. The basic limit for intraday liquidity available for a bank is twice its average deposit balance held with the BOK. If a bank needs more than its basic limit, it may request the Bank of Korea to increase its limit. Penalty interest (daily average call rate+2%p) is imposed on an intraday overdrafts facility, which is not repaid by the closing time of BOK-Wire.

Half-day call transactions between participating banks can be used to meet intraday funds shortages at the designated settlement times during either the morning or the afternoon. Morning half-day call money is automatically transferred across the two banks' BOK accounts at the designated time of 11:30 a.m., when multilateral net settlements resulting from the Bank Giro, CD/ATM, and IFT System etc. are executed. It is automatically repaid across the two accounts at 2:30 p.m. that day. In a similar process, afternoon half-day call money is furnished by the lending bank at the designated time of 2:30 p.m., when multilateral net settlements resulting from cheque clearing are executed. It is automatically repaid to the lending bank at 4:30 p.m.

An advance funds transfer arrangement has also been introduced, so that a participant bank anticipating net debit positions in check clearing can arrange the transfer of the necessary funds in advance, with its branches or with other banks anticipating net credit position at the designated settlement time of 2:30 p.m. For the smooth operation of net settlement systems, the time during which such an arrangement is requested is from 1:30 p.m. to 2:10 p.m. (noon¡-12: 40 p.m. on Saturdays). No such arrangement is allowed at the morning's designated settlement time of 11:30 a.m. The differences between a half-day call transaction and an advance funds transfer arrangement are as follow. First, there are no fees charged for the advance

funds transfer arrangement, but in the half-day call transaction system, the borrowing bank pays fees of 200 won per 100 million won borrowed. Second, in the half-day call transaction system the call money is automatically repaid to the lending bank at the designated time, but this is not the case in an advance funds transfer arrangement.

2.1 Cross Border Payment and Settlement Systems

Both small and large-value cross-border payments are made primarily through overseas correspondent banks. With regard to retail transactions, there are several means by which cross-border transactions can be carried out, for example, credit cards, banker's drafts, and traveler's checks. Settlement of credit card transactions by overseas travelers is executed through correspondent banks, and the related messages are transmitted through the networks of international credit card firms such as VISA and MasterCard. Foreign credit card holders may withdraw cash from domestic CDs and ATMs; however, debit cards issued abroad may not be used in settlement of domestic purchases.

In the case of large-value international transactions such as banks' foreign exchange transactions and securities transactions, foreign currencies are paid and received principally on a trade-by-trade basis through nostro accounts held with overseas correspondent banks. In some transactions, however, foreign exchange payments and receipts are made through nostro accounts held with local correspondent banks instead of overseas correspondent banks. A bank whose currency trade scale is so small that it need not maintain a nostro account with an overseas correspondent bank uses this method. This method is also used when the value today KRW/USD deals in the Korean FX market cannot be settled on that day through a U.S. correspondent bank because the value date falls on a U.S. public holiday.

Domestic currency payments arising from foreign exchange transactions are made directly to counter party accounts through BOK-Wire on a real time gross settlement (RTGS) basis, like payments made in domestic transactions, because there is no independent payment system for the settlement of the domestic currency legs of foreign exchange transactions. The process of domestic currency payments is the same as those of the funds transfers made in the Domestic Currency Funds Transfer System of BOK-Wire.

The core participants in the correspondent banking system mostly used for cross border payments are commercial banks, referred to as "foreign exchange banks". Foreign exchange banks can conduct all types of foreign exchange business. In principle, all foreign exchange payments and receipts should be made through foreign exchange banks. As of June 2001, there were 64 foreign exchange banks in Korea, consisting of 22 domestic banks and 42 foreign bank branches. Non-bank financial institutions are allowed to conduct foreign exchange business related with their own businesses.

Average daily foreign exchange turnover in Korea amounted to U$ 9.2 billion in the second quarter of 2001. Among all currency pairs traded in the Korean foreign exchange market, Korean won/ US dollar transactions are the most actively traded pair, accounting for about 80% of total turnover value. For reasons of market depth and liquidity, most currencies including KRW, JPY, EURO and GBP are traded against the USD only, and it is estimated that USD-related trades amounted to about 99% of total FX turnover. Most transactions between Korean won and other foreign currencies are actually executed through back-to-back transactions against the US dollar. In other words, Korean banks trade other foreign currencies against USD in the Hong Kong or Japanese market in the same time zone, and then trade USD against KRW in the Korean market, rather than exchanging other foreign currency for KRW directly in the Korean market.

3. The Implications of Existing Payment and Settlement Systems for Financial Stability

3.1 Monetary Policy

In consultation with the government, the Bank of Korea establishes an inflation target every year, based on the annual average rate of increase of core inflation. Accordingly, the BOK carries out its monetary policy with an emphasis on achieving the inflation target. In conducting monetary policy, the BOK sets its target for the overnight call rate and then makes use of monetary policy instruments such as loan and rediscount policy, open market operations, changes in reserve requirement ratios, etc.

The Bank of Korea employs loan and rediscount policy to control the availability of banking institutions' funds in order to affect liquidity conditions in the markets. The Monetary Policy Committee sets the aggregate credit ceiling for the BOK's extension of loans to the whole banking sector every three months. Individual loan ceilings are then allocated

to each bank according to such criteria as its performance in the discount of commercial bills, loans for foreign trade, reserve position, etc. The credit ceilings on individual banks are fine-tuned by the Bank every month.

The Bank of Korea carries out open market operations frequently to affect the level of reserves in the banking system. These operations involve purchases and sales in the open market of government securities, securities guaranteed by the government, Monetary Stabilisation Bonds (MSBs), special negotiable obligations of the BOK, and other eligible securities. Open market operations are suitable for day-to-day use because they are flexible in time and in magnitude.

The Bank of Korea may impose reserve requirements on the deposit liabilities of banking institutions. The ratios of reserve requirements to deposit liabilities may not exceed 50 percent but, in a period of pronounced monetary expansion, it may require banks to maintain minimum reserves of more than 50 percent and up to 100 percent against any increase of their deposits. Should the reserves of banking institutions fall short of the legal reserve requirement determined by the Monetary Policy Committee, the institutions concerned must pay the Bank a penalty of one percent of the amount of the average deficiency during that period. As of the end of June 2001, the general reserve requirement ratio stood at 5 percent, while a lower ratio of 1~2 percent applied to a few long-term time and savings deposits.

3.1.1 Timely Information

The increase in the use of electronic payment systems and the launch of BOK-Wire enable the Bank of Korea to monitor banks' funds flows and positions more quickly and accurately, which may well have a positive effect on its credit operations. In addition, a Monetary and Financial Information System is established in BOK-Wire to gather information from participating banks about bank loans and deposits, foreign exchange positions, required reserves, etc. on a real time basis. The new system, which replaced the previous mail and facsimile reporting system, helps the BOK to secure effectiveness in monetary policy and detect factors that could cause disturbances in the economy, as it shortens the recognition lag in implementing the necessary measures.

3.1.2 Implementation of Monetary Policy

To maintain price stability in the economy, the Bank of Korea makes use of such monetary instruments such as changes in reserve requirements, loan policy and open market operations. Recently, the BOK's day-to-day implementation of monetary policy has been mainly conducted through the use of repurchase agreements (RPs) involving government and government-guaranteed bonds. Transfers of reserve money and funds flows among banks in accordance with these monetary policies are executed via BOK-Wire, which as a result, acts as a core channel for the transmission of monetary policy.

Changes in the payments system, especially the use of paperless payment instruments and the development of electronic payment systems, not only impact the pattern of settlement and the stock of money held by the private sector but also accelerate the transmission of monetary and credit policies. In Korea, the share of cash in M1 began to drop from the early 1980s when the Bank Giro System and in-house on-line systems were put into operation in banking. This general underlying trend has been accelerated further since around 1990, when electronic funds transfer methods such as the Interbank CD/ATM System and the IFT System came into full use. The reduction in the share of cash in M1 could well increase the creation of deposit money.

Even though development of electronic payment instruments brings about reduction of demand in cash, cash still plays a core role for retail payments, face-to-face transactions between individuals and between individuals and merchants. The ratio of cash held by the public to nominal GDP had been decreasing from 3.4% in 1994 to 2.8% in 1999, but increased to 2.9% in 2000, as shown in table 4. It is envisaged that electronic payment media will not be perfect substitute for cash in the near future.

Table 5
Ratios of Cash to Nominal GDP

(Unit: trillion won)

	1991	1994	1997	1998	1999	2000
Cash in circulation (A)	6.4	11.1	14.0	12.8	13.4	15.0
Nominal GDP (B)	216.5	323.4	453.3	444.4	482.7	517.1
A/B (%)	3.0	3.4	3.1	2.9	2.8	2.9

Electronic payment instruments such as credit cards, interbank funds transfer systems, etc. also have substituted the promissory notes and current account cheques which are widely used in business transactions between companies in Korea. In the last ten years the use of cheques and bills has radically decreased by volume, down to 30.8% from 74.6% of all non-cash payments, while electronic funds transfers have increased from 7.5% to 39.9% of all non-cash payments over the same period. Card usage has also increased significantly, particularly in replacing cash payments in the consumers' purchase of goods and services. This increase came mainly from credit card companies' aggressive expansion strategy and credit card's benefit of an interest-free period. Debit cards, on the contrary, are not widely used because of consumer preference for credit cards.

Table 6
Ratio of Paper-based and Electronic Payments

(Unit: % of all non-cash payments by volume)

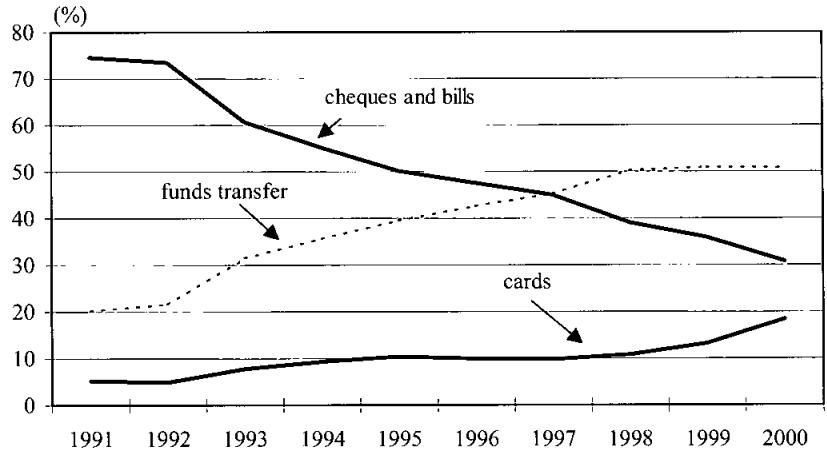
	1991	1995	1997	1998	1999	2000
Paper-based payments	87.3	67.1	59.5	52.1	47.4	41.7
(Cheques and bills)	*(74.6)*	*(50.1)*	*(45.0)*	*(39.0)*	*(35.9)*	*(30.8)*
(Funds transfers)	*(12.7)*	*(17.0)*	*(14.5)*	*(13.1)*	*(11.5)*	*(10.9)*
Electronic payments	12.7	32.9	40.5	47.9	52.6	58.3
(Funds transfers)	*(7.5)*	*(22.5)*	*(30.7)*	*(37.1)*	*(39.4)*	*(39.9)*
(Cards)	*(5.2)*	*(10.4)*	*(9.8)*	*(10.8)*	*(13.2)*	*(18.4)*

3.2 Payment System Oversight

Under Article 81 of the Bank of Korea Act, revised in December 1997, the Bank of Korea retains the right to engage in the operation and management of the payment systems insofar as these relate to monetary and credit policies. Therefore, the BOK has the general responsibility for ensuring the safety and efficiency of the payment and settlement systems in Korea.

With regard to BOK-Wire, the Bank of Korea carries out its oversight role through issue of regulations, direct provision of settlement accounts and services, and application of sanctions to counter abnormal behaviour by participants. It also oversees the operation of retail payment systems by par-

Chart 7
Weight of Non-cash Payment Instruments



ticipating in the decision-making process of the KFTC, the operator of the retail payment systems, through the chairmanship of the KFTC's General Meeting and as a member of its Board of Directors. In addition, the BOK periodically receives statistics on retail payment and settlement from the KFTC. Meanwhile, the BOK can participate on a joint basis in the Financial Supervisory Service's on-site inspections of banking institutions, checking their compliance with payment systems regulations.

The Financial Supervisory Service is in charge of consumer protection in the field of payment services, as a financial regulator.

3.3 Competition/Innovation

In Korea, there are no specific laws and regulations to discipline competition in the payment systems and payment services. Instead, the Monopoly Regulation and Fair Trade Act, a general law stipulating prohibition of collusive practices and anti-competitive transactions in all kinds of business, can also be applied to payment transactions. Under this Act, market conditions for most payment services and payment systems are, in principle, competitive and fair.

BOK-Wire, a large-value payment system operated by the Bank of Korea, is open to all the participants. All banks and non-banks holding accounts with the BOK are eligible to participate in the BOK-Wire System. On the other hand, there are restrictions placed on non-banks' participation in the retail payment systems operated by the KFTC, for the sake of the stability and security of its operations. While banks can participate in the system without prior consent, non-banks must acquire the consent from the General Meeting of the KFTC to join the system.

With regard to provision of payment systems, economic factors such as economies of scale and barriers to entry, limits competition, even though there are no explicit restrictions on establishment of a new payment network. Because most major banks are currently members of the KFTC, which all operates retail payment systems, and the size of the market is not large for two or more payment systems for the same payment services, every new payment network has always been introduced and operated by the KFTC which the consent of all members. Currently, the KFTC is exclusively operating all 10 retail payment systems in Korea.

Because fees for payment services, which the financial institutions provide are currently liberalised, banks are engaging in more competitive pricing policies related to their payment services. Most banks use price discrimination depending on the method of service provision as a way of recovering their real costs of providing services. They charge cheaper fees for services provided through automatic processors, such as Internet banking, phone banking, ATM, etc., than for services handled by bank clerks at the bank counters.

Most Korean banks, however, realise that service fees are rather low and do not cover all expenses necessary to provide payment services, especially paper-based payment services such as cheques and certain credit transfers. For instance, cashier's cheques are widely used as a close substitute for cash in Korea and accounting for about 24% in volume of total retail payments. Although there are no accurate data on all expenses related with issuance, collection and storage of these cheques, the total cost is assumed to be huge. Currently, in spite of large handling costs, Korean financial institutions are finding it rather hard to raise service fees to cover real expenses, as there is great public pressure on them to provide public goods cheaper.

Payment services are mostly provided by domestic banks, which comprise 17commercial banks and 3 specialised banks. Banking institutions provide various payment services for their customers such as issuance of cashier's cheques and credit cards; the installation of CDs/ATMs for withdrawal and transfer services based on demand deposits; and provision of other payment services such as bank giro credits and other interbank funds transfers. Checking accounts can be opened only at banks, and not at non-bank institutions. Recent financial innovations and demands from customers for better financial services have led banks to provide more competitive new payment services such as firm banking and home banking services. Other institutions, which provide payment services, are credit card companies, the Post Office and member cooperatives of the agricultural and fisheries cooperative federations.

4. Consumer Protection

The Financial Supervisory Service (FSS) is in charge of customer protection as a rule maker in the business of financial institutions' payment services. The FSS establishes measures to resolve disputes relating to banks and non-banks and mediates disputes between consumers and financial institutions. The Financial Dispute Settlement Committee established in the FSS in accordance with the Act Concerning the Establishment of the Financial Supervisory Organisation is its supreme mediation body, whose settlement decision has the same effect as reconciliation made by a court of law if the parties concerned accept the decision. The Committee enables consumers to reach speedy and convenient settlements of their financial disputes, without costly and time-consuming lawsuits.

The Fair Trade Commission, a government agency in charge of removing anti-competitive regulations and securing fair trading practices in all businesses according to the Monopoly Regulation and Fair Trade Act, is also responsible for consumer protection and fair competition in the payment services area.

Although the Bank of Korea does not have direct responsibility for consumer protection, the BOK is making efforts to enhance the reliability of the payment instruments and systems for the protection of the participants in the system. For instance, the BOK introduced the Corporate Procurement Loan System to tackle problems of payment delay and possible successive default arising from the use of promissory notes.

In Korea, promissory notes are used extensively as means of payment for credit transactions by most firms in business transactions. Sellers, mostly medium and small-sized businesses, frequently receive promissory notes with 60 or 90 days maturity date from the buyers of which mostly large-sized corporations. In effect this means that the sellers have extended two or three months of credit to the buyers at zero interest, large corporations can easily transmit financial crunch to small-sized firms, especially during periods of recession. Also, as the promissory note can be assigned to others by more endorsement, there are usually several firms involved in the circulation of a promissory note. Thus, if an original issuer goes insolvent and dishonors the note, numerous related users can easily fall into financial difficulties as well. In this context, the Bank of Korea introduced the Corporate Procurement Loan in 2000 in order to discourage the use of promissory notes in business trade. More detailed information on the Corporate Procurement Loan System is described in the next topic.

5. Recent Payment System Developments and Policy Initiatives

5.1 Check Truncation

Procedures for processing bills, cheques and giro documents include physical movement of collected slips among branches, headquarters and clearing houses. This involves a high operational cost and has been a factor detrimental to the improvement of productivity by bank branches. Thus, the Bank of Korea has recently initiated cheque truncation, through which the process of collection of cheques and bills is completed through the exchange of digital data only, without the actual transport of physical items.

Under the truncation system, the clearing and settlement of bills and cheques is conducted by the electronic transmission of information through a computer network, instead through their physical transportation. Each branch or parent branch of a participating bank captures information on bills and cheques and converts it into electronic data for use by an automatic recognition device. These electronic data are transmitted to the clearing house by way of the bank's computer center, and the physical bills and checks are kept at the branch or parent branch of the payee's bank.

As the first stage, the BOK introduced check truncation for cashier's cheques in Seoul on May 2000, and for paper-based giro of four large public utility companies in July 2000. The BOK is currently expanding the use of this method to include the remaining paper-based items, such as other

cheques and paper-based giro. With the introduction of cheque truncation, about 95% of total cashier's cheques exchanged in the Seoul area, and about 22% of giro documents handled by the KFTC, are processed via the new method of digital information exchange.

5.2 DvP Settlement

In November 1999, the Bank of Korea, in collaboration with the Korea Securities Depository, the central securities depository institution in Korea, introduced DvP settlement in central bank funds for over-the-counter (OTC) bond transactions. The purpose was to eliminate principal risk in the securities settlement procedure, and to guarantee settlement finality corresponding to international standards. To conduct DvP in central bank funds, the Bank of Korea linked BOK-Wire to the computer center of the Korea Securities Depository. Thus, OTC-traded bonds can be settled on a DvP basis through BOK-Wire.

On the other hand, in the case of exchange-traded stocks, both funds and stocks are currently settled at a designated time on a T+2 basis, of which stocks are transferred under the book-entry system of the KSD, while funds are settled through the accounts of commercial banks designated by the KSD. To meet the CPSS/IOSCO's recommendations for securities settlement systems, the Bank of Korea is exploring the possibility of DvP settlement in central bank funds for exchange-traded stocks.

5.3 Development of Electronic Money

In Korea, three kinds of e-money have been developed so far, namely K-CASH, the Mondex card and the Mybi card.

K-CASH, a closed-loop card type and pan-bank e-money, has been developed in collaboration with the banks and credit card companies in early 1996. As a result of this effort, the pilot project for K-CASH was launched in July 2000 in the Yoksam-dong area, in the southern part of Seoul, and used throughout the country starting in the early 2001. K-CASH stores a maximum amount of 200,000 won. The Bank of Korea has participated in the decision-making process involved in developing K-CASH from the conception of the project, in accordance with its policy considerations as a member of the committee coordinating banks' projects related to the payment and information systems.

The Mondex card was provided by Mondex Korea, established in January 1998 as a subsidiary company of MasterCard Corp. The issuer is Kookmin Bank, one of the commercial banks operating nationwide in Korea, and the pilot project was launched in June 2000 in the COEX (Convention and Exhibition Center), in Samsung-dong, Seoul.

The Mybi card was introduced by Pusan Bank, one of the local banks in Korea. It can be used both as a credit card and as a direct debit card. The pilot project was launched in September 2000 in Pusan, and is currently being expanded into the field of transportation.

Presently, it is difficult to predict the degree of e-money usage in the future. However, it can be anticipated that e-money will be used largely in retail payments, when it will become usable on network such as Internet.

5.4 Electronic Banking Network

In order to cope up with the increasing volume of interbank funds transfers in pc banking, telebanking and Internet banking in Korea, payment networks for electronic banking have been established in recent years namely the E-Commerce Payment Gateway System and the Electronic Banking System.

5.5 Discouragement of Use of Promissory Notes

In Korea, promissory notes have been frequently used in the business transactions to defer payment for procuring materials and goods, etc. Default by an original issuer of a note can result in successive default of all users involved in the circulation of a promissory note. Moreover, it requires considerable cost for financial institutions to handle promissory notes.

In order to address these problems of promissory notes, the Bank of Korea introduced the Corporate Procurement Loan System in 2000. Under this system, after delivering goods, a seller issues a bill of exchange drawn on the buyer, instead of receiving a promissory note, and puts it through for collection. The buyer's bank then advances the Corporate Procurement Loan to the buyer, who settles the bill of exchange with the loan, and the seller can then receive cash shortly after the funds settlements between banks.

A purchasing card system was introduced by some commercial banks in 1999. It is a special credit card, the use is which limited to purchase of specific goods and services from the member firms of the card system. Purchasing cards are used as a substitute for the promissory notes by the purchasing firms in concert with the banks. This card system can improve the procurement process of the purchasing firms and cut down expenses related with management of bills, etc. Meanwhile, suppliers can be instantly paid for their goods by the banks.

5.6 Electronic Giro

One of the methods to promote the use of electronic payment instruments instead of paper-based ones is through the electronic giro. The KFTC developed the electronic giro system, and many companies including large utility companies are now using this system.

Under the new system, the payee sends a list of payments to the KFTC, and the KFTC notifies the payer, through e-mail, of the payments requested by the payee. The payer approves the payments and pays it through the Internet, or the payer's bank automatically withdraws the payments from the payer's account. Then, the KFTC confirms the settlement amount with the payer's and the payee's banks, and sends netting settlement statements to the Bank of Korea.

6 Suggestions and Recommendations on the Role of the Central Banks in Ensuring the Safety and Efficiency of the Payment and Settlement Systems

The most important task of the central bank in the field of payment systems is to secure the safety and efficiency of the payment and settlement systems, since they are essential mechanisms supporting the stability of financial markets. In order to achieve this goal, the central bank should strengthen its oversight role to reduce the settlement risks and operating costs in the payment systems and enhance the reliability of the payment instruments. In addition, the central bank needs to cooperate with the financial supervisory authorities to ensure the individual system participants' financial soundness.

From this point of view, the roles and policy tasks of the Bank of Korea should be as follows:

Firstly, the Bank of Korea should exert effort to minimise the risks involved in the net settlement systems. As these systems maintain open positions until final settlement, a problem exists that a single shortfall in liquidity can cause a temporal gridlock, which could possibly escalate to an extreme case of systemic risk. The BOK should also try to reduce settlement risk arising from securities settlement and foreign exchange settlement, in co-operation with the supervisory authorities concerned.

Secondly, the Bank of Korea should discourage the use of paper-based payment instruments and encourage the development of electronic payment instruments. Paper-based payment instruments such as cheques and promissory notes are very costly compared with electronic payment instruments. The financial institutions usually pass the handling costs to consumers, which consequently result in the inefficiency of payment systems. Moreover, cheques and promissory notes are widely circulated by endorsement; default of an original issuer could bring about successive defaults of several users involved in the circulation of an instrument.

Thirdly, as the central bank's oversight role in the design and operation of the payment systems has become important, the Bank of Korea's oversight function needs to be coordinated with other authorities' functions. Proper distribution and coordination of oversight and supervision functions among the BOK, the Financial Supervisory Commission and the Ministry of Finance and Economy is considered vital to achieving effectiveness in oversight of the payment systems.

Annex 1

Country Tables

Table 1. Major events affecting the payment and settlement systems

Date	Major Developments
July 1910	Opening of the Seoul Clearing House
February 1977	Launch of Bank Giro System
September 1980	Start of Credit Card business by commercial banks
July 1988	Launch of Interbank CD/ATM Network
April 1989	Introduction of ARS system
December 1989	Launch of Interbank Electronic Funds Transfer Network
December 1994	Launch of BOK-Wire (Central bank's RTGS system)
February 1996	Launch of Electronic Funds Transfer at POS System
February 1998	Establishment of the E-Commerce Law
February 1999	Establishment of Digital Signature Act
May 2000	Introduction of Check Truncation, Corporate Purchasing Card linked Loan
July 2000	Launch of K-Cash (e-money) Network
April 2001	Launch of Electronic Banking Network

Table 2. Selected Country Indicators

	1995	1996	1997	19998	1999
Population (millions): Year end	44.9	45.5	46.0	46.4	46.9
GDP (in billions)	351,294.8	418,470.0	453,276.4	444,366.5	483,777.8
GDP per capita (in thousands)	7,832.5	9,188.3	9,855.8	9,570.7	10.324.3
Exchange Rate (against USD)					
Year end	774.70	844.2	1,415.2	1,207.8	1,145.4
Average	771.04	804.8	951.1	1,398.9	1,189.5

Table 3. Settlement media used by non-banks (at year end) (in billons of Korean Won)

	1995	1996	1997	1998	1999
Notes and coin	15,060.5	15,453.1	15,447.7	13,670.4	19,474.6
Transferable deposits	39,699.3	44,337.7	35,343.6	37,663.0	42,119.6
Narrow money supply (M1)	38,872.8	39,542.1	35,036.1	35,582.5	44,374.5
Memorandum item:					
Broad money supply (M2)	153,945.3	178,311.6	203,531.5	258,538.4	329,317.4
(M3)	527,017.0	614,961.5	700,285.4	787,627.3	850,827.8

Table 4. Settlement media used by banks

	1995	1996	1997	1998	1999
Reserve balances held at central bank Of which:	9,701.7	8,829.5	4,975.6	4,733.6	6,254.0
Required reserves*	9,683.5	8,814.0	4,959.3	4,706.6	6,224.6
Free reserves	18.2	15.5	16.3	27.0	29.4
Transferable deposits	-	-	-	-	-
Memorandum item: Institutions' borrowing from central bank	11,345.8	6,758.8	10,971.2	13,884.3	8,713.8

* All reserve balances can be used for payment purposes. Legal reserve requirements are larger than this and vault cash at banks covers the deficiencies.

Table 5. Institutional Framework (1999)

Categories	Number of Institutions	Number of Branches	Number of Accounts (thousand)	Value of Accounts (billion)
Central bank	1	20	0.8	6,254.0
Commercial:	67	5,627	n.a	42,119.6
Public	4	1,404	n.a	9,895.6
Private	17	4,161	n.a	31,770.6
Foreign	46	62	n.a	453.4
Development and Investment banks:	1	37	n.a.	173.9
Public	1	37	n.a..	173.9.
Private				
Foreign				
Special Finance Houses	1,456	4,797	n.a.	4,604.3
Money Exchangers*	1,131	-	-	-
Post Office	1	2,800	378	449.2

* Moneychangers only buy foreign currencies and traveler's checks

Table 6. Cash dispensers, ATMs & EFTPOS terminals (volume in thousands, value in billion)

	1995	1996	1997	1998	1999
Cash dispensers and ATMs:					
Number of networks (year-end)	1	1	1	1	1
Number of Machines (year-end)	26,231	36,604	42,674	41,397	42,475
Volume of transactions (during)	151,050	177,974	239,517	260,885	324,312
Value of transactions (during)	32,012	55,672	79,854	80,037	109,972
EFTPOS:					
Number of networks (year-end)	-	1	1	1	1
Number of Machines (year-end)	-	682,213	779,988	879,423	1,099,991
Volume of transactions (during)	-	660	1,119	1,441	1,892
Value of transactions (during)	-	33.8	57.1	63.6	98.1

Table 7. Number of Payment cards in circulation (at year-end, in thousands)[1]

	1995	1996	1997	1998	1999
Cards with a cash function *	n.a.	n.a.	n.a	n.a	n.a
Cards with a debit/credit function[2] of which	24,379	41,868	55,337	60,931	65,413
Cards with debit function	-	12,290	24,423	33,636	39,315
Cards with credit function	24,379	29,578	30,914	27,295	26,098
Cards with a cheque guarantee Function	-	-	-	-	-
Memorandum item: Retailer cards	221	115	44	24	11

* Most credit cards have a cash function and nowadays cash-withdrawal-only cards are negligible.

[1] Most cads are multifunctional and may appear in several categories. It is therefore not meaningful you add the figures.

[2] Overlaps with cards with a cash function.

Table 8. Payment instructions handled by selected payment systems: volume of transactions

(In thousands)

	1995	1996	1997	1998	1999
Retail:					
Cheque Clearing System	1,010,470	1,146,626	1,222,191	1,012,463	1,027,172
Bank Giro System*	509,013	648,340	700,121	664,818	636,246
Interbank Funds Transfer	137,716	197,288	241,991	270,263	320,603
Interbank CD/ATM System	105,153	177,974	239,517	260,885	324,312
CMS System*	-	2,826	44,924	103,534	172,717
Shared ARS network	95	190	250	230	142
Large Value (BOK-Wire)	1,103	1,273	1,491	1,425	1,399
Post Office					
Postal money orders (issued)	5,122	6,120	6,968	7,992	8,602
Postal cheques	31,555	31,472	29,330	26,764	29,956

* These systems include direct credit transfers and direct debit transfers

Table 9. Payment Instructions by selected payment systems: value of transactions

(In billions of Korean won)

	1995	1996	1997	1998	1999
Retail:					
Cheque Clearing System	6,416,338	7,435,701	7,391,659	7,505,823	9,677,298
Bank Giro System*	47,705	56,692	60,402	55,797	55,194
Interbank Funds Transfer	348,131	600,525	979,401	1,154,294	1,589,201
Interbrain CD/ATM System	32,012	55,672	79,854	80,037	109,972
CMS System*	-	668	4,889	8,526	14,582
Shared ARS network	215	72	22	20	12
Large-value (BOK-Wire)	5,407184	7,277,950	9,496,390	14,290,165	19,975,616
Post Office					
Postal money orders (issued)	0.42	0.40	0.42	0.39	0.42
Postal cheques	29.6	30.2	31.4	25.8	31.3

* These systems include direct credit transfers and direct debit transfers

Table 10. Indicator of use of various cashless payment instruments: volume of transactions

(In thousands)

	1995	1996	1997	1998	1999
Bills and cheques cleared	1,010,470	1,146,626	1,222,191	1,012,463	1,027,172
Payments by cards	210,157	239,272	267,338	282,966	378,543
Credit cards	210,157	238,612	266,219	281,526	376,651
Debit cards	-	660	1,119	1,440	1,892
Paperless credit transfers	593,526	786,444	885,952	882,395	992,665
Postal money orders	5,122	6,120	6,698	7,992	8,602
Postal cheques	31,555	31,472	29,330	26,764	29,956

Table 11. Indicator of use of various cashless payment instruments: value of transactions

(In billions of Korean won)

	1995	1996	1997	1998	1999
Bills and cheques cleared	6,416,318	7,435,701	7,391,659	7,505,823	9,677,298
Payments by cards	40,670	47,634	51,763	47,084	59,773
Credit cards	40,670	47,600	51,706	47,020	59,675
Debit cards		34	57	64	98
Paperless credit transfers	419,197	700,702	1,105,395	1,274539	1,741,090
Postal money orders	0.42	0.40	0.42	0.39	0.42
Postal cheques	29.6	30.2	31.4	25.8	31.3

Table 12. Transfer instructions handled by securities settlement systems: volume of transactions

(In millions)

	1995	1996	1997	1998	1999
Korea Stock Exchange					
Stocks	7,656.0	7,785.4	12,125.3	28,533.1	69,359.1
Bonds	n.a	n.a	n.a	n.a	n.a

Table 13. Transfer instructions handled by securities settlement systems: valued of transactions

(In billions of Korean won)

	1995	1996	1997	1998	1999
Korea Stock Exchange					
Stocks	142,914.1	142,642.2	162,281.5	192,845.2	866,923.5
Bonds	1,429.9	1,378.4	4,044.5	15,488.8	293,606.7

Table 14. Summary of Penetration of Payment Instruments

(In thousands)

Volume of transactions		1995	1996	1997	1998	1999
Checks and Bills		1,010,470	1,146,626	1,222,191	1,012,463	1,027,172
Cards	Credit Cards	210,157	238,612	266,219	281,526	376,651
	Debit Cards	-	660	1,119	1,440	1,892
Funds Transfer	Credit Transfers	593,526	786,444	885,952	882,395	992,665
	Debit Transfers	158,451	240,394	341,850	417,353	461,355

(In billions of Korean Won)

Value of transactions		1995	1996	1997	1998	1999
Cash		15,061	15,453	15,448	13,670	19,475
Checks and Bills		6,416,338	7,435,701	7,391,659	7,505,823	9,677,298
Cards	Credit Cards	40,671	47,600	51,706	47,021	59,675
	Debit Cards*	-	34	57	64	98
Funds Transfer	Credit Transfers	419,197	700,702	1,105,395	1,274539	1,741,090
	Debit Transfers	8,866	12,943	19,174	24,135	27,871

* Introduced in 1996

Table 15. Large Value Payment System

(In thousands)

Volume of transactions	1995	1996	1997	1998	1999
BOK-Wire	1,103	1,273	1,491	1,425	1,399

(In billions of Korean Won)

Value of transactions	1995	1996	1997	1998	1999
BOK-Wire	5,407,184	7,277,950	9,496,390	14,290,165	19,975,616

The Financial Sector Informatisation Promotion Committee

In the latter half of 1970s, commercial banks in Korea started to build up on-line links between their head offices and branches to provide electronic payment services. Such intra-bank on-line networks were introduced in full-scale by the middle of 1980s.

In 1984, the government, recognising the need of constructing a single nationwide financial information network that inter-links all banks in the nation, with a view to avoid duplicate investment, designated the financial information network as one of the five backbone national information networks. In line with this government policy, the Bank of Korea organised the Committee for Electronic Financial System in September 1984, as one of the sub-committees under the government's Committee for Telecommunication Network Systems Development.

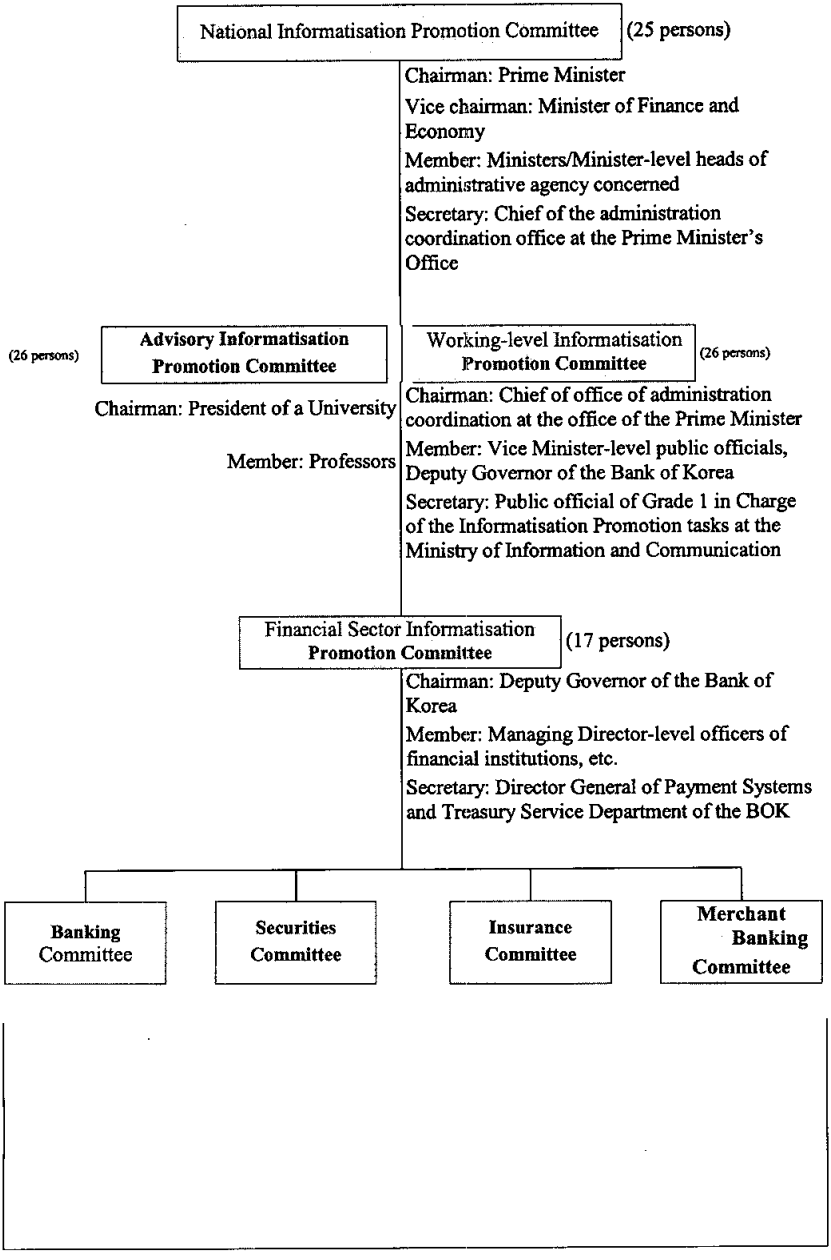
In June 1996, the Committee was renamed as the Financial Sector Informatisation Promotion Committee, following the promulgation of the Framework Act on Informatisation Promotion. The Financial Sector Informatisation Promotion Committee, chaired by the Deputy Governor of the Bank of Korea, carries out deliberations on issues including master plan for financial informatisation, the assessment of implementation and performance, the selection of joint projects for financial institutions, the formulation of safety measures for the financial network and other issues considered necessary for the promotion of financial informatisation nationwide.

For the purpose of carrying out tasks in a more efficient manner, four subcommittees for banks, securities companies, insurance companies, and merchant banks are in operation. The Bank of Korea plays a secretariat role, handling the administrative tasks of the Committee.

All the interbank electronic retail payment systems in Korea, such as the Interbank CD/ATM Network System, the Interbank Funds Transfer System etc. were introduced by the resolution of the Committee. In the process of introducing a new electronic payment instrument, the Bank of Korea takes a leading role in designing the framework, the Committee makes a decision whether to adopt it or not, and the Korea Financial Telecommunications and Clearing Institute (KFTC) assumes the development of the necessary software.

Annex 3

Organisation for Korea's Financial Informatisation Promotion
(As of the end of June 2001)



Chapter 3

THE PAYMENT AND SETTLEMENT SYSTEMS IN MALAYSIA

by

Azzad Abdul Razak*

1. Introduction

1.1 Historical Background

In Malaysia (then Malaya), the issue of currency notes only commenced in 1897, while settlement by cheques only commenced with the introduction of the Bills of Exchange Act in 1949. The clearing and settlement of cheques was undertaken by the commercial banks themselves prior to the establishment of the Central Bank in 1959. In tandem with the technological developments around the world, cards for payment including debit and credit cards were introduced in the 1980s. The latest innovation was e-money in September 1999. E-money or digital/electronic money is used to settle transactions using the electronic medium. It can also be in the form of a trade unit that carries monetary values for the conduct of business through the Internet.

As a Central Bank, Bank Negara Malaysia (BNM) has a mission in developing and providing quality clearing, settlement and payment services as well as undertaking the lead role in system design and development of systemically important payment systems. These initiatives aim to promote and support a sound and progressive financial sector. In light of globalisation of financial markets and rapid technological advancements within the financial sector, an efficient and effective payment system would facilitate financial institutions in being more innovative and efficient in their banking products and services. In 1994, BNM together with the banking industry formulated a Payment System Masterplan to develop and enhance the national

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payment systems. This Masterplan was meant to outline the progress of the payment systems for the period of 1995-1999.

The payment system masterplan charted the development and implementation of the payment systems in Malaysia. This masterplan is an integrated approach to ensure the successful development of the payment systems infrastructure. The objectives of the masterplan amongst others, were to set realistic and attainable targets to be met by the year 2000, whilst highlighting pertinent issues and problems relating to payment systems. It also charted out effective strategies to address issues and problems in achieving the stated targets. The masterplan also identified measures to further develop the payment system. The payment system masterplan focused on four major modes of payment instruments, namely cash, cheques, card-based payment instruments and electronic-based payment mechanism. The handling and usage of these instruments need to be enhanced in order for the payment systems to be systematic and efficient.

The masterplan's strategies include de-emphasising the use of cash, whilst improving the efficiency of cash handling through automation and specialisation; expediting the cheque clearing process and promoting card-based payment instruments to substitute cash and cheques. The masterplan also emphasises the development of accepted, efficient and reliable paperless electronic payment network for the transmission and settlement of payment instructions nationwide.

In line with the concept of de-emphasising the use of cash, whilst improving its handling, the approach was to provide and promote alternative payment mechanisms, which are inexpensive, secure, reliable and efficient in nature. It also promotes installation and usage of self-service handling machines so as to farm out cash counting, storage and distribution functions to maximise economies of scale.

The main strategies for cheque clearing were to automate the clearing facilities at major commercial centres and to reduce the day-hold for cheque clearing to not more than 5 days nation-wide. In order to expedite achievement of these targets, an enhanced automated cheque clearing system is progressively being developed on a regional basis. In keeping abreast with global technological advancements, a new system using imaging technology for cheque clearing was implemented in several phases. This system was first introduced in November 1997 in the Kuala Lumpur area and extended to Johor Bahru and Penang in 1998.

Card-based payment infrastructure and mechanisms are also being developed to substitute for cash and cheques. In order to develop the card-based mode, initiatives that are being taken include conforming to new technology to reduce credit card fraud; enhancing EFTPOS facilities to promote the usage of debit cards; and promoting multi-purpose payment cards. To prevent the unauthorised usage of credit cards, measures such as the usage of "PIN pad" and *Electronic Data Capture* (EDC) terminals are being introduced. *EFTPOS* terminals have also been installed extensively for supporting the growing point-of-sales transactions. The introduction of smart card technology in recent years has given rise to usage of stored value cards as another means of card-based payment mode.

The banking industry is experiencing universal advancement in payment modes via electronic means. To support this development, some of the initiatives that have been taken include the establishment of an industry wide on-line real time funds transfer system within the financial sector and the establishment and usage of the payment *Electronic Data Interchange* (EDI). Other initiatives include integrating the *Automated Teller Machine* (ATM) network nationwide, developing a safe and efficient settlement system for the integrated ATM and EDI networks, and also adopting common technical standards for electronic-based payment architecture in the banking industry.

The introduction of the Real Time Gross Settlement system to facilitate large value inter-bank funds transfer also fulfilled one of the recommendations of the Payment Systems Masterplan, which was to enhance the previous end of day net settlement system.

1.2 Methods of Making Payments and Settlements

Cash as a means of payment is the most popular and traditional way of carrying out transactions in the country. Its usage covers all types of payments made between consumers, businesses and the government. Nevertheless, the cost of printing and processing physical money is relatively high in addition to the substantial outlay for storage and security of cash holdings.

Other than cash, the usage of cheque is largely common as a payment method for retail purposes. This is evidenced by the increasing amount of cheques being cleared over the past five years. Due to the increasing trend of usage, in November 1997, the cheque clearing system was enhanced fur-

ther. One of the reasons for such a move was to address issues, such as extended day holds for cheque clearing resulting from lack of infrastructure. Other problems included bad cheques arising from technical or human errors, which affected the acceptability of cheques and as a result, prolonged the cheque processing and clearing function.

Card-based payments are a growing trend in making payments and purchases. Credit, debit, charge and stored value cards are the main card-based payment methods in the country. Nevertheless, credit card purchases are more prevalent relative, and even now, to other card transactions. As a result, credit card fraud is on the rise and as such, steps are being taken to curb this problem. In spite of the increasing trend in the usage of card-based payment products, the development of such payment modes is being curtailed by the reluctance of participants to share the card infrastructure, as well as lack of co-ordination in adopting new technologies.

On the other hand, in the advent of technological advancements in the financial industry, electronic payment means such as Internet banking, mobile banking, electronic bill presentment, and also usage of ATM for making transactions, are gaining popularity as alternative means of payment delivery channels in Malaysia. Nevertheless, the usage of electronic payments needs to be improved further as the existing infrastructure is not fully utilised. For instance, the utilisation of ATMs is mainly for cash withdrawals (about 75% of total transactions) and balance inquiries (10%). In addition, with the rapid technological expansion of electronic payment products globally, banking institutions are vulnerable to settlement and security risks that are associated with these advanced payment methods.

In terms of clearing and settlement, private organisation or a correspondent bank processes most of the retail payments on a multilateral net basis. Whereas, for large value clearing and settlement, the Central Bank operates the system and processes on a real-time gross settlement basis. BNM also handles the clearing of cheques.

1.3 The Institutions that Provide Payment and Settlement Services

The main facilitator in making payments has been the banking institutions. To expedite and facilitate settlements amongst the banking institutions, BNM and the banking institutions have established several computerised payment systems as central platforms to undertake the delivery and transfer of money. Among others, these systems cater for the clearing and set-

tlement of cheques, interbank transfers of funds and the processing and settlement of scripless securities. Nevertheless, the advancement of information technology has facilitated the emergence of non-banking sectors, particularly the telecommunication companies, in providing payment services.

The payment system in Malaysia is centralised at BNM. Today, this system consists of the Real Time Electronic Transfer of Funds and Securities (RENTAS - i.e. the RTGS system for the large value interbank transfer system) and the image-based cheque clearing system, Sistem Penjelasan Imej Cek Kebangsaan (SPICK), both of which are operated by BNM. The systems in BNM are complemented by a host of other proprietary systems owned and operated by financial institutions and other private entities. The proprietary systems consist of credit, debit and charge card systems, ATM networks, the giro system, stored value payment cards, the Securities Clearing Automated Network Services (SCANS) and the Malaysian Derivatives Clearing House (MDCH).

- *Commercial banks*

Commercial banks form the largest group of financial institutions in the country. As at end of September 2001, there were 11 domestic commercial banking institutions and 14 foreign owned banks with a total of 1,719 bank branches. With the completion of the bank merger exercise, the number of domestic commercial banks has been consolidated into 10 banking groups. The banking institutions provide payment services via their own proprietary network, and through their clearing accounts with BNM to effect interbank funds transfer or third party payments.

Together with the Islamic banking institutions, the commercial banks offer ATM services through 3,355 machines located on and off branches. A number of them are credit and/or debit card issuers that offer electronic funds transfers at point of sale (EFTPOS) terminals. The introduction of Internet banking in Malaysia, in 2000 saw a total of six commercial banks providing Internet banking services that facilitate online banking for account enquiries, transfer of funds between accounts, loan repayments, and online bill payment to various utility companies and municipalities. In addition, commercial banks also provide the Interbank Giro system to facilitate large volume interbank funds transfer.

In Malaysia, only commercial banks and Islamic banking institutions are allowed to offer demand deposit accounts that provide checking facil-

ity. Consequently, both commercial banks and Islamic banking institutions are the participants of the SPICK cheque clearing system.

- *Finance companies*

Finance companies are the second largest group of deposit-taking institutions. There were 19 finance companies and a total of 599 branch offices as at end September 2001. The finance companies provide payment services through the ATM network and the Interbank Giro. As a group, finance companies have a total of 606 ATM machines as at end September 2001.

- *National Savings Bank*

The national savings bank or Bank Simpanan Nasional (BSN) was established in 1974 to promote and mobilise private savings, especially of small savers in the lower income groups and those in the rural areas. As at end of 2000, the BSN has 427 branches nationwide with a network of 610 ATMs. Besides providing financial services such as postal savings and pensions, the BSN also provides payment services through its own proprietary ATM network, credit cards, and pre-arranged crediting of salaries and debiting of public utility charges.

- *Credit and charge card companies*

In Malaysia, credit card companies do not issue their cards directly to the cardholders. Instead, their cards are issued by commercial banks, finance companies and the BSN through licensing arrangements. There are 18 credit card issuers in the country. Unlike the credit card companies, charge card companies like American Express and Diners Club International issue their card directly to the cardholders. In addition to these international charge cards schemes, there are several domestic companies issuing charge cards in Malaysia.

Overall, an integrated approach and close coordination by BNM with the financial institutions are essential to ensure effective implementation of new systems. In this regard, BNM also works closely with a private company, Malaysian Electronic Payment Systems (1997) Sdn. Bhd. (MEPS), which is a payment consortium owned by the banking institutions, in developing an effective and efficient Malaysian payment system. MEPS have been given the mandate by the Central Bank to undertake the electronic

funds transfer functions for retail transactions. The objective for the formation of this consortium was to avoid duplication of investment or resources by individual banks in undertaking payment systems related projects. By pooling their resources, the banking institutions are able to provide a common platform for product innovation reaching out to a larger customer base. Since its inception, MEPS has implemented several payment systems related projects including the integrated ATM network for the domestic banking institutions, a payment gateway to support Internet transactions, the Payment Multipurpose Payment Card (PMPC), Interbank Giro and the MEPS Cash e-money scheme.

1.4 Legal Framework

In Malaysia, several sets of legislation constitute the legal framework for payment and settlement systems. The Central Bank of Malaysia Act, 1958, (CBA) which established BNM, provides for the Central Bank to assume responsibility for issuing Malaysian currency and outlines the statutory requirements governing the issue of currency.

The CBA stipulates that BNM is responsible for providing the clearing house facility in the banking system. The Banking and Financial Institutions Act, 1989, (BAFIA) prohibits any person from operating any electronic fund transfer system without the approval of BNM. The law relating to cheques and other bills of exchange is codified in the Bills of Exchange Act, 1949 and the Contracts Act, 1950.

The Bills of Exchange Act, 1949 was amended in 1998 to be in line with technological innovations and developments to allow for presentment of cheques through a document image processing system.

The Central Bank had also issued guidelines on money laundering and "know your customer policy" in December 1993. The guidelines highlight the need for banking institutions to have a comprehensive knowledge of the transaction profile of their customers to prevent the banking institutions from being used as vehicles in money laundering. In addition, in view of the rapid advancement in payment technology through the Internet, the Government has also enacted legislation such as the Computer Crime Act, 1998 and the Digital Signature Act, 1998, to protect the users of such payment methods.

BNM performs its oversight functions as part of its overall responsibility in regulating and supervising the banking system. The oversight func-

tion is conducted through various means including on and off site supervision, issuance of guidelines and through moral suasion.

The BAFIA provides for an integrated supervision of the Malaysian financial system and modernises and streamlines the different regulatory regimes overseeing the banking and other financial institutions as well as introduces new prudential requirements. The BAFIA also provides BNM with the powers to regulate and supervise all licensed institutions, namely commercial banks, finance companies, merchant banks, discount houses and money brokers. BNM is also vested with the power to regulate and supervise, if necessary, the scheduled institutions namely, credit and charge companies. On this basis, BNM has the capacity to oversee and regulate, whilst ensuring smooth payment and settlement systems among the users and operators of the systems.

As a whole, the enactment of the CBA and BAFIA has given BNM the authority to govern and safeguard the payment systems in order to facilitate an effective, efficient, secure and reliable payment system for the nation. On the other hand, with the expansion of usage of payment systems and also the introduction of new payment methods due to technological advancements, BNM sees the need to have specific legislation on payment systems and thus, issues pertaining to it are currently being examined in much closer detail.

2. Existing Payment and Settlement Systems

2.1 Domestic Payments

2.1.1 General Overview

The domestic large value payment system in Malaysia is based at BNM. Both, the RENTAS (RTGS system) and SPICK (cheque clearing system) are operated and managed by BNM, whilst the participants of both systems are financial institutions operating in Malaysia and the Central Bank itself. Despite BNM owning the system, the operational rules of the systems were established jointly with the Association of Banks in Malaysia. In this respect, all participants of the systems are subject to the rules.

On the other hand, as mentioned, other proprietary systems for relatively small value payments, which consist of credit, debit and charge card systems, ATM networks, the giro system, e-money or stored value

cards, the clearing of securities and derivatives are operated without the direct involvement of BNM. Transactions from these sources may be settled through bilateral interbank correspondent accounts between participants, with the settlement ultimately being channeled through the clearing and settlement facilities provided by the Central Bank.

In retail payment systems, MEPS, the payment consortium, has been given the mandate by BNM to undertake electronic funds transfer activities for several retail transactions. The company owned by domestic banking institutions, was formed in March 1997 following a merger between two 'switching' companies to undertake and implement payment systems related projects. The objective for the formation of this payment consortium was to avoid any duplication of investment or resources by the member banking institutions in undertaking related projects, which are applicable amongst members.

MEPS, since its establishment, had initiated several payment systems related projects namely, the integrated ATM network; Nationwide Payment and Clearing System (a backbone infrastructure); switching mechanism for card-based payments (i.e. credit, debit and e-money cards); Payment Multi-purpose Card project; SET (Secure Electronic Transaction) Payment Gateway (related to e-commerce); and the interbank GIRO system.

Other types of settlement systems, which are not directly under the purview of BNM, involve mostly the clearing and settlement of derivatives and securities. The Securities Commission (SC) regulates the derivatives and securities clearing houses such as the Malaysian Derivatives Clearing House Berhad (MDCH) and the Securities Clearing Automated Network Services (SCANS). SC was established in March 1993, under the Securities Commission Act 1993, as a self-funding statutory body with investigative and enforcement powers to streamline the regulatory structure and the development of the capital markets.

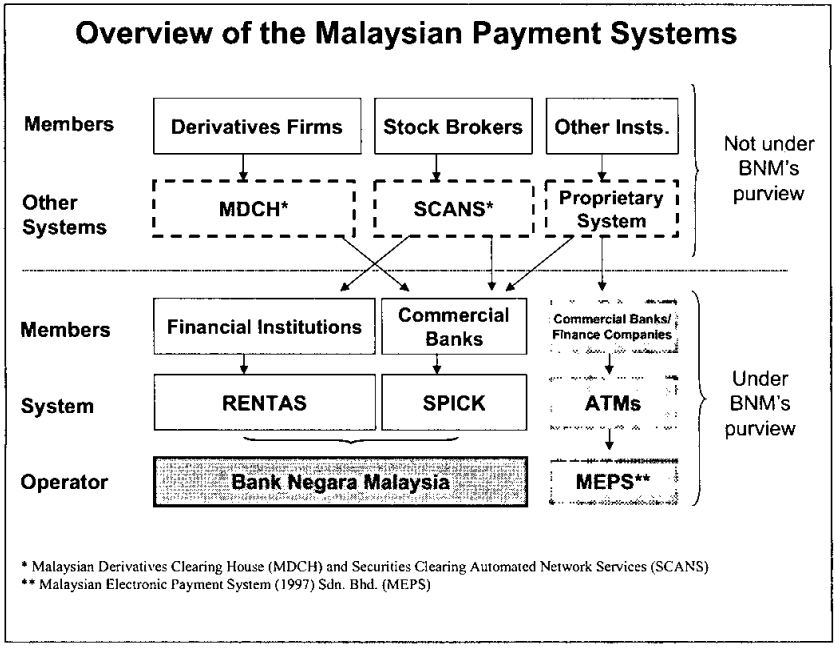
The MDCH is the Clearing House for the Futures Exchange in Malaysia. Its primary function is to ensure that the financial obligations under the futures contracts entered into on the Exchange are performed in a timely manner. MDCH is the guardian of financial integrity in the futures market as the members look to it to perform the contracts and to reduce their counterparty risks. MDCH is now the single clearing house for the derivatives industry in Malaysia. It clears stock index futures and options; interest rate futures; and palm oil futures. The clearing house has several func-

tions, which include providing risk management facilities for exchange-traded derivatives and netting of multilateral payment obligations.

SCANS, on the other hand, was incorporated in November 1983 and commenced operations as the securities clearing house, appointed by the Kuala Lumpur Stock Exchange (KLSE)[1]. SCANS provides clearing and settlement facilities for trades between Clearing Members (vis-à-vis the Member Companies of KLSE) of SCANS. Historically, this function was undertaken by the individual stock broking companies themselves. SCANS also extends its clearing and settlement services to the Malaysian Exchange of Securities Dealing and Automated Quotation Berhad's (MESDAQ) members. The objective of SCANS is to provide Clearing Members with facilities for clearing contracts done between them and for delivering stocks and securities to and receiving stocks and securities from each other and for receiving or paying any amounts payable to or payable by such Clearing Members in connection with all equity transactions. The main function of SCANS centres on providing clearing and settlement services for the Clearing Members for trades done on KLSE and MESDAQ. Clearing membership of SCANS includes trading members i.e. the stock broking companies, which are member companies of KLSE and members of MESDAQ, and also non-trading members, which are the financial institutions.

MDCH and SCANS, both fall under the regulatory oversight of the Securities Commission. Nevertheless, the payments for the capital markets will be made via the banking institutions and thus, with the net balances of correspondent accounts being ultimately settled through the BNM facilities.

1. The Kuala Lumpur Stock Exchange is a self-regulatory organisation, which governs the conduct of its members and member stock broking companies in securities dealings; enforces the listing requirements, which spell out the listing and disclosure standards to be maintained by public listed companies; and which is also responsible for the surveillance of the market place.



Box 1: Overview of the Malaysian payment systems. *Bank Negara Malaysia handles RENTAS and SPICK directly, whilst other proprietary schemes owned and operated by financial institutions and other private entities complement these systems.*

2.1.2 Payment Methods

2.1.2.1 Cash Payments

In Malaysia, BNM has the sole right to issue notes and coins in Malaysia as provided under the Central Bank Act 1958. The Bank currently issues notes in 5 denominations, namely RM1, RM5, RM10 RM50 and RM100. As for coins, BNM outsources the production of coins to a private entity. At present, the coins are issued in five denominations, 1 sen, 5 sen, 10 sen, 20 sen, and 50 sen. The total value of currency in circulation as at end of 1999 totalled RM30.5 billion (RM3.80 equals to USD1.00). Notes and coins in circulation represented a total of 41.5% of M1 monetary aggregate, as at the same date.

Similar to other developing countries, cash is the most common retail payment medium used in Malaysia. Its usage covers all types of payments

made between consumers, businesses and the government. Typical cash payments include utility bill payments, payments for transportation fares, purchases of groceries, shopping, and others. Despite the emergence of other non-paper based payments mechanism such as newly established electronic payment methods, it is envisaged that cash will continue to be a major retail payment instrument for Malaysia.

Nevertheless, with the increasing usage of electronic transfer of funds through Internet banking and interbank GIRO, and the national roll-out of the Government's MyKad[2], a multipurpose smart card with Government and payment applications, and the PMPC, it is anticipated that there would a gradual shift from cash to electronic money for retail payments.

2.1.2.2 Non-Cash Payments

a. Cheques

Other than cash, the usage of cheque is largely common as a payment method for retail purposes, particularly amongst the business community. All Ringgit denominated cheques are cleared through the SPICK cheques clearing houses, which are located at three areas in Malaysia. These clearing houses are located at Kuala Lumpur, which covers the states of Selangor, the city itself, Negeri Sembilan, Melaka, Perak and Pahang; the Northern Region for the states of Kedah, Perlis and Penang; and, the Southern Region, which covers the state of Johore. As for the areas that are not covered by SPICK, namely the states of Terengganu, Kelantan, Sabah and Sarawak, the cheque clearing is conducted on a manual basis. For the year 1999, a total of 154.1 million cheques valued at RM1,041.9 billion were cleared through the three automatic clearing houses in Malaysia.

Acknowledging the importance of cheque as a payment method, Bank Negara Malaysia with the collaboration from the banking industry have been undertaking two pronged strategy to improve the acceptance of cheque as a payment tool:

2. Government Multipurpose Card (GMPC) or officially known as MyKad, is a smart card based multi-application ID card for the Malaysian citizen. Currently, it serves as an ID card, a driving license and as an immigration card to facilitate speedy entry/exit from the immigration points. GMPC is one of the Multimedia Super Corridor's flagship applications.

- Improve the cheque clearing process by reducing the day-hold for cheque clearing. BNM implemented a new system using imaging technology for cheque clearing, SPICK which covers the Central, Southern and Northern regions; and
- Clamp the incidence of cheque dishonors due to insufficient funds.

The continuing incidence of cheques dishonored due to insufficient funds require specific measures to be put in place to deal with the problem. Cheque Information Bureau, a central bureau to monitor the "bad" cheque incidents and take action against the offenders was established in Bank Negara Malaysia in 1988. Its objectives are to instill discipline among the banking public and to promote the usage of cheques as an acceptable mode of payment.

The salient features of the Bureau's guidelines on bad cheques are:

(i) Issuance of "bad" cheque refers to a cheque issued by an account holder which is dishonored by the drawee bank due to:
   - *Insufficient funds in the account; or*
   - *"Effects not cleared"; or*
   - *Account closed for reasons other than blacklisted.*

(ii) Each occurrence of bad cheque drawn from the same account will be treated as a bad cheque incident.

(iii) Issuance of three bad cheques from the same account within 12 months from the date of the first incident constitutes a "bad" cheque offence.

(iv) "Bad" cheque offender will subject to global closure of account, i.e. his/her current account with all commercial banks will be closed. As such he/she cannot operate any checking facility during the prohibition period.

(v) A current account-holder who has been blacklisted would be given a clean record if he/she does not commit any further "bad" cheque offence during the probation period. Any offence after the probation period will be considered as the first offence. However, if he/she commits any further "bad" cheque offence during the probation period, it will be considered as committing subsequent level of bad cheque offences.

b. Direct Debit and Credit Transfers

Direct debit transfers are mainly used to effect recurring payments such as utility bills, insurance premiums, loan repayments, and others. As such, individual transaction amounts are normally of small value. The usage of

the credit transfer facility is popular amongst corporations and government agencies for purposes of making scheduled payments to various parties. Typical transactions using credit transfer system is the payment of salaries.

c. Automated Teller Machines (ATM)

Most banking institutions in Malaysia own proprietary ATM networks as a convenience to their customers. To further improve their customer services, domestic banking institutions have established three ATM switches, which were linked to each other in 1997 with the establishment of the MEPS. MEPS, was established to consolidate and operate the switching, clearing and settlement operations of the networks. With the merger of these ATM networks, Malaysia has moved to a more cost efficient use of resources by operating a single, integrated ATM network for the banking institutions. With MEPS shared ATM network, the public is able to access their bank accounts and conduct transactions such as cash withdrawals and balance enquiries at any ATM machine nationwide within the MEPS network. Currently, all domestic commercial banks, finance companies and Islamic banks in Malaysia are linked to the MEPS shared ATM network. Nevertheless, as part of the recommendations for the banking sector in the Financial Sector Masterplan, incumbent foreign banks will be allowed to operate their own ATM network in the future.

Besides cash withdrawals, ATMs also provide an expanded range of services such as bill payments, funds transfer between accounts and payment for shares subscription at initial public offerings. In recent years, rapid installations of ATMs have occurred, especially amongst the major banks. The number of ATMs in operation had increased from 2,632 units at the end of 1995 to 3,904 units as at the end of 1999. As at end of 1999, about 234.5 million transactions valued at RM54.6 billion were carried out at the ATM machines nationwide.

2.1.2.3 Payment Cards

a. Credit Cards

Credit card or "buy now pay later" payment mechanism is the most popular card based payment instrument used in Malaysia and its usage has been increasing over the recent years. Only institutions with the prior approval of BNM are allowed to issue credit cards in Malaysia. Currently, there are 19 institutions issuing credit cards mainly with Visa and

MasterCard brands. In a recent development, other card brand such as American Express has also issued its credit card via a banking institution.

In Malaysia, credit card issuers are subject to guidelines on credit card operations issued by BNM, which among others, include the following requirements:

(i) The minimum age for the principal card holder shall be 21 years old;
(ii) Minimum income requirement of RM1, 500 per month or RM18, 000 per annum;
(iii) Minimum monthly repayment of 5% of the outstanding balance; and
(iv) The maximum finance charge shall be 1.5% per month or 18% per annum.

The credit card industry is expanding rapidly in Malaysia. By the end of 1999, there were 2.35 million credit cards in circulation and transactions valued at RM11.9 billion were recorded. While credit cards provide cash advance facility, most of the Malaysian credit card holders use credit cards for payment purposes, which represent 85% of the total credit card transactions. However, during the economic slowdown in 1997 and 1998, there were tendencies amongst credit card holders to secure cash advances from their credit card accounts. For example, total cash advances accounted for 35.9% of the total credit card transactions in 1997 and 29.9% in 1998.

b. Charge Cards

Charge card is another form of payment mechanism frequently used in Malaysia. Typically, charge cards are issued by non-banking institutions without any line of credit. It enables the cardholders to make purchases, but does not offer revolving credit and as such, the cardholders need to settle in full the amount due at the end of a specific period. The main charge card companies in Malaysia are American Express and Diners Club. In addition, there are a few domestic card operators issuing charge cards for payment of specific services offered by companies.

While BNM does not regulate charge card operations, operators of charge cards are required to obtain prior acknowledgement from the Central Bank to operate such schemes.

c. Debit Cards

The usage of debit cards is gaining popularity in Malaysia. At present, there are three banking institutions issuing domestic debit cards on a proprietary basis (i.e. their cards can be used only at merchants acquired by the banks themselves). In addition, there are also international debit card brands, such as Visa Electron and MasterCard Electronic, available in Malaysia. These cards are issued by the banking institutions.

As a step forward to improve the operations of the domestic debit card system and promote the usage of debit cards in Malaysia, MEPS has set up a domestic debit card switching network that enables universal usage of domestic debit cards at all debit card merchants.

d. Stored Value Cards/E-money

In Malaysia, the development of electronic money products (here defined as stored value cards/products in which a record of the funds or value available to the consumer is stored on a device in the customer's possession) started in 1980s with the introduction of the single purpose telephone cards. The development in information technology has promoted the emergence of several types of single purpose e-money schemes. In 1997, MEPS and the banking institutions jointly undertook to develop a multipurpose stored value card using smart card technology. The national multipurpose stored value card application or better known as MEPS Cash was developed based on the Proton e-money system developed by Proton World International. The MEPS Cash card was piloted in September 1999 at selected areas in Kuala Lumpur. Six banking institutions participated in the MEPS Cash pilot programme, either as the issuers, acquirers or both with a total of 187 merchants accepting the MEPS Cash card.

The banking institutions and the system operator are now planning to roll out the MEPS Cash application beyond the city of Kuala Lumpur. Besides being introduced as a stand-alone card, the MEPS Cash will also be issued as an application in the normal banking card known as the PMPC and also the MyKad. Besides MEPS Cash, the transportation and telecommunication sector introduced their respective stored value cards for convenience of payments at toll plazas and telephone booths. Rangkaian Segar Sdn. Bhd. introduced the Touch N Go card for transportation purposes while Telekom Malaysia Berhad and other telephony companies have introduced telephone cards. Other utility providers are also intending to issue their respective stored value cards.

2.1.2.4 Other Payment Delivery Channel

Banks' branches are still the major delivery channels used by the banking institutions in Malaysia to deliver services to their customers. The rapid development in information technology has enabled the banking institutions to expand their delivery channels mainly through remote channels. Some of the delivery channels include the following:

a. SET Payment Gateway (Payment Gateway for Internet Transactions)

Secure Electronic Transaction (SET) Payment Gateway is a gateway for Internet purchases (i.e. to facilitate payment for e-commerce activities) using credit cards. MEPS was entrusted by BNM to set up the payment gateway with the main objective of establishing a monitoring mechanism for e-commerce activities in Malaysia. This would enable the country to monitor the volume of trade conducted through the Internet in view of the rapid development of such transactions worldwide.

The implementation of the Payment Gateway is an integral component of the electronic commerce infrastructure not only in Malaysia, but worldwide. The global inter-operability of this system allows any consumer who complies with SET to buy from Malaysian merchants securely from around the world. E-commerce transactions are now more secure over the Internet and other open computer networks.

MEPS and the banks provide SET and MOSET (which enable both SET and SSL[3] transactions) facilities to be accepted by merchants. The payment gateway also accepts purely SSL transactions from merchants and members of the public. Therefore, all participating Malaysian banks and locally incorporated foreign banks can accept SET and SSL transactions using the credit card, for payment over the Internet.

The payment gateway allows business-to-consumer (B2C) and business-to-business (B2B) e-commerce transactions. It was launched in March 1999 with 9 participating banking institutions. As at end 1999, the volume of transactions through the payment gateway was 1,217 transactions with a total amount of RM8.35 million.

3. SSL – Secure Socket Layer and SET are two security protocols for payment over the Internet.

b. Interbank GIRO System

The Inter Bank GIRO (IBG) system was launched in April 2000 to enable GIRO transactions to be carried out between different bank accounts. IBG is an interbank fund transfer system designed to handle a high volume of low value interbank payments. The main objective of IBG is to efficiently debit one bank account and credit another. The system will generate the transaction onto electronic media for payment and collection through the IBG system. This will reduce the time of crediting the amount to a consumer's account, especially to an outstation account.

The IBG facilitates third party payment between the participating banking institutions for values of less than RM50, 000. It includes standing instructions for loan repayment, payment of insurance premiums, salaries, income tax payment, Employees Provident Fund and other 'over the counter' transactions. Currently, the system only allows domestic banking institutions to participate. There are 11 banking institutions (including one Islamic bank) that are providing the system at present. As at September 2001, a total of about 72,000 transactions with a total value of RM622.3 million had been carried out through the IBG system.

In IBG system, the parties involved are the originating financial institution, the system operator (i.e. MEPS) and the receiving financial institution. The originating financial institution receives payment instructions from the originators or customers and forwards those instructions to MEPS. MEPS would then distribute those entries to the appropriate receiving financial institutions, and perform settlement functions for the respective financial institutions. On receiving the entries from MEPS, the receiving financial institutions would make the necessary posting to the accounts of the ultimate receivers/beneficiaries.

c. Electronic Banking

Banking institutions in Malaysia provide electronic banking in one form or another. This includes telephone banking, desktop banking, mobile banking and home banking. Desktop banking and telephone banking are common electronic distribution channels. However, the level of utilisation and concentration of these technologies are different between banking institutions depending on their respective business strategies.

d. Internet Banking

Effective from 1 June 2000, domestic banking institutions have been allowed to provide a full range of Internet banking facilities, subject to compliance with the guidelines on Internet banking issued by BNM. Typically, the services offered by the banking institutions through their Internet banking facilities are balance account summary, request for account statements, fund transfers between own accounts or third party accounts, payments facilities and cheque services.

There are three main types of Internet banking services in Malaysia, namely, Informative; Communicative; and Transactive. In order to foster orderly development of Internet banking services, BNM, via its "Guidelines on Internet Banking" in June 2000, the following have been outlined:

- Domestic banking institutions can offer all types of Internet banking services;
- Locally incorporated banking institutions can use Internet for information and communication; and
- By January 2002, locally incorporated foreign banking institutions can provide transaction services.

In addition, there are several banking institutions in Malaysia currently, that use the Internet as a platform to provide information about their services to the banking public.

e. Electronic Bill Presentment and Payment

Electronic bill presentment and payment system is a system that facilitates customers to view and pay their various utility bills (e.g. electricity, telephone bills) electronically via the Internet. Depending on the system architecture, credit card and direct debit are the most preferred payment method. Regardless of the nature of the Internet sites, most of the systems are linked to the banking system.

2.1.2.5 Postal Remittance Services

Pos Malaysia Berhad (PMB) is the nation's main agency to provide postal services. In line with the economic growth in Malaysia, PMB has further upgraded the remittance services to fulfil customer's needs for a cheap, convenient, efficient, safe and reliable remittance service. The types

of remittance services that are being offered by PMB include the following:

- *Domestic ordinary money order*
  This service is equivalent to bank draft provided by commercial banks. It is, however, more convenient to remit money through this service because of the vast post office network (over 600 outlets);
- *Express money order*
  This money order service enables the remitter to send money urgently needed by the payee;
- *International money order*
  This service enables remittance of money overseas and vice versa;
- *Trade charge money order*
  This service is meant to assist businessmen or firms to "sell" their products through the mail. PMB delivers the products and collects the payment on behalf of the clients; and
- *Postal order*
  The postal order service is similar to that of a money order. The payee can receive cash at the post office in exchange for a postal order.

Nevertheless, these postal remittance services are not under the purview of BNM.

2.1.3 Structure, Operation and Administration

2.1.3.1 Large Value Interbank Funds Transfer System

A Real-time Electronic Transfer of Funds and Securities (RENTAS) system was implemented since 24 July 1999 and it is an RTGS system for the transfer and settlement of high value ringgit denominated interbank funds and scripless securities transactions. RENTAS System will enable payment instructions between the participants of the system to be processed and settled individually and continuously throughout the working day. All settled transactions are considered as final and irrevocable. Thus, the receiver is able to use the funds immediately without being exposed to the risk of the funds not being settled. This new system replaced the previous system, SPEEDS (Electronic Transfer System for Funds and Securities), which settled the funds on an end-of-day net settlement basis. With the introduction of the RENTAS System, Malaysia becomes the seventh in Asia and 29th country in the world to introduce a RTGS System for interbank payments and securities transactions.

Prior to RENTAS, SPEEDS was used as the system for large value interbank fund transfers. *Sistem Pemindahan Elektronik untuk Dana dan Sekuriti* (SPEEDS) or Electronic Funds and Securities Transfer system, was a computerised "paperless" and scripless book entry system for effecting both funds and securities transactions. Being a high value payment system, it was used for interbank and inter-branch funds transfers, adjustment of statutory deposits, settlement of Export Credit Refinancing transactions, money market and foreign exchange settlements and transactions on behalf of the Government and its agencies.

SPEEDS had two sub-systems namely, the Interbank Funds Transfer System (IFTS) and Scripless Securities Trading System (SSTS). The former was implemented in December 1989 and the latter in January 1990. IFTS is an on-line funds transfer system for the participating institutions, whilst SSTS is an on-line book entry system for Malaysian Government securities, Treasury bills, Cagamas[4] bonds, Bank Negara Bonds/Bills and scripless public debt securities, to name a few.

Owing to the increasing volumes and values of both funds and securities processed and settled over the years and the increasing risks to BNM, as the operator of the system, a more efficient and secured system was warranted. In addition, SPEEDS was not a Y2K-compliant system; it lacked a sound legal basis for multilateral netting; the system had no constraint on the size of the intraday deficit that a participant could chalk up; it lacked rules to govern defaults by banks; and also repudiation of transactions and moneys advanced for the settlement are not secured.

Given the unsatisfactory environment of SPEEDS operations, it was timely to implement an RTGS or RENTAS. This system has become the most common means of controlling risks associated with large value payments in developed financial markets. RENTAS is a gross settlement system in which the initiation, transmission, processing and settlement of funds transfer instructions and scripless securities transactions take place in real-time and simultaneously. The transfers are settled individually (i.e. without

4. Cagamas Berhad is a national mortgage corporation that was established in 1986 to promote the secondary mortgage market in Malaysia. It borrows money by issuing debt securities and uses the funds to finance the purchase of housing loans from the financial institutions, selected corporations and the Government.

netting debits against credits) and the system also provides intra-day finality (i.e. payee banks able to receive funds with certainty) for individual transfers.

As RENTAS is based on real-time, it is the most common means of controlling risks. The system will substantially reduce interbank settlement and systemic risks and will also eliminate counterparty settlement risk as it enables delivery versus payment (DvP) for electronic book-entry securities transaction. RENTAS also enables better liquidity management by the participants.

a. Participants in the System

There are two types of memberships, namely the financial institutions which offer conventional banking and those that operate *Skim Perbankan Islam* (Islamic Banking Scheme). The former has 53 members, including BNM, whilst the latter has 36 members. The figures also include members, which operate both banking schemes. The main membership criteria for RENTAS are as follows:

- Licensed financial institutions, which fall under the BAFIA;
- Participate in the local money market operations; or
- Maintain current account with BNM.

b. Types of Transactions Handled

RENTAS is essentially an electronic"paperless" processing and settlement system comprising two sub-systems:

1. Interbank Funds Transfer System (IFTS)

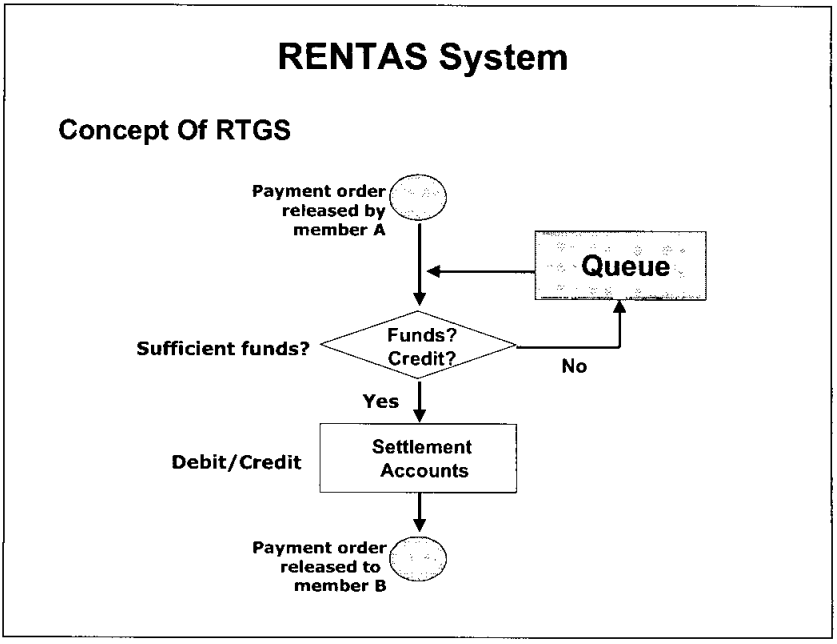
   To effect, process and settle the transfer of high value Ringgit interbank funds with BNM and among the participating member institutions; and

2. Scripless Securities Trading System (SSTS)

   To effect, process and settle scripless securities (e.g. Government Securities, BNM Papers, Cagamas Bonds and unlisted private debt securities) on a *Delivery versus Payment* basis.

c. Operation of the System

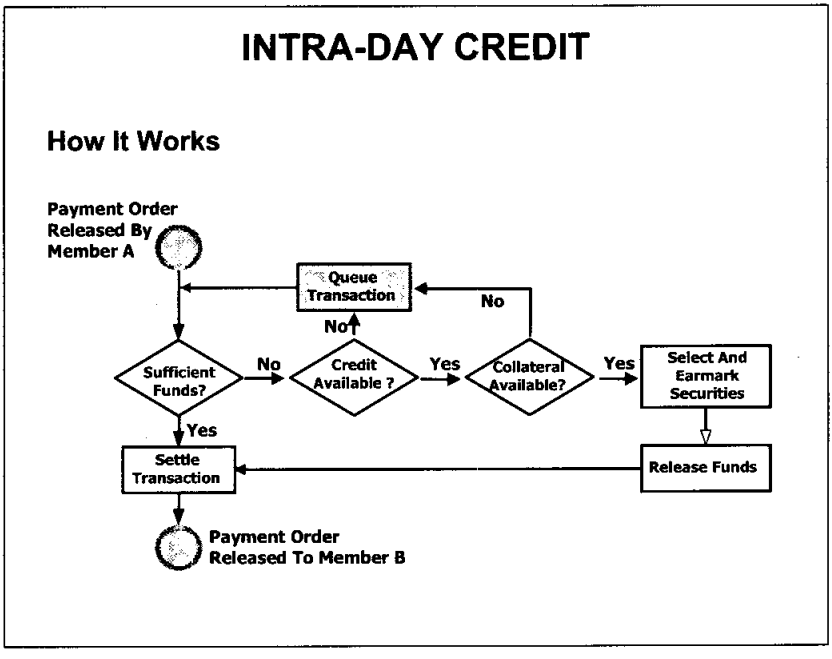
1. Interbank Funds Transfer System (IFTS)



Box 2: The concept of RTGS in RENTAS system. *Settlement is done on a real-time basis provided there is sufficient funds/securities (for intraday credit).*

- Participants maintain clearing account with BNM
- Remitting bank initiates the transaction (credit transfers only)
- System validates payments in chronological order
- Immediate settlement if funds are sufficient or intraday credit available (tranches of RM5.0 million on fully collateralised basis minus haircut percentage)
- Insufficient funds or securities, transactions queued
- Financial institutions can resequence/re-order queue
- Redemption of intraday credit effected automatically when sufficient free funds available
- Outstanding transactions in queue automatically cancelled at closing time. Confirmation sent to sender.
- Outstanding intraday credit must be redeemed at the end of day

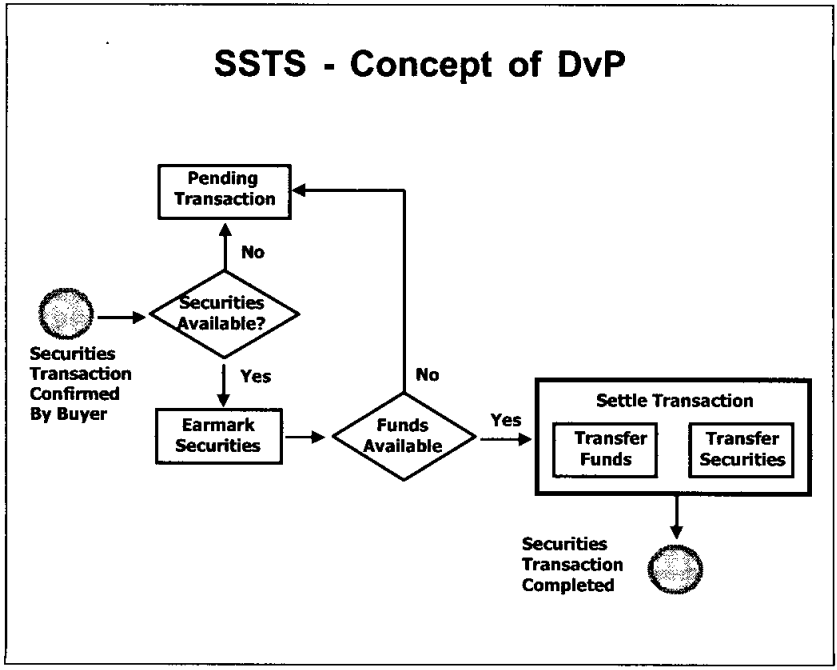
- Information on account balance and status of payment orders available to participants



Box 3: Concept of Intraday credit in RENTAS. Transactions are queued at instances of insufficient funds and unavailability of collateral.

2. Scripless Securities Trading System (SSTS)

- Delivery versus Payment (DvP) basis
- Participants maintain consolidated security account with BNM
- Selling bank initiates transaction
- Buying bank confirms transaction
- System checks on real-time basis availability of security and funds
- Transfer of funds and security are automatic and instantaneous
- If either security or funds not available or insufficient, transactions will queue pending availability
- Queued transactions cancelled automatically at the end of the day
- At day end, the system determines the balance in the security account



Box 4: Concept of DvP in SSTS. *Transactions are queued at instances of unavailability of securities and insufficient funds.*

The RENTAS system also allows the following processing sequence order:

- Sender is able to set payment priorities
- For a given priority, the FIFO basis applies
- Sender has the ability to change sequence of queued payment orders
- System has gridlock detection and resolution feature

In addition, smartcard is used as a security feature for authorisation at the participants' end for all transmissions.

RENTAS daily operation hours are as the following:

- Activity Sequence:

	Monday – Friday (Hrs)	Saturday (Hrs)
RENTAS Opening	0800	0800
Cutoff warning	1600	1100
Intra-day credit cutoff	1630	1130
RENTAS cutoff	1800	1300

d. Volume of Transactions Handled

The daily average volume for IFTS and SSTS is 5,000 and 300 transactions respectively. These average volumes correspond to a value of around RM55 billion for IFTS and RM5 billion for SSTS.

e. Settlement Procedures

RENTAS being an RTGS system, all transactions are executed on a real-time basis and settled individually (i.e. without netting debits against credits), provided there is a sufficient fund at the sending bank's settlement account. All interbank payments are to be effected through the system. Payments for settlement, once executed are considered final, unconditional and irrevocable.

Several types of settlement accounts are maintained in the RENTAS system, which include, conventional or SPI (Islamic scheme) current account; statutory reserve account; and vostro account. These accounts can be updated and inquired on a real-time basis. They are also managed by the financial institutions.

For SSTS, the settlement of the transaction will be effected on the settlement date:

(i) *Same day value trades:*

Mon-Fri : Deals transacted before 3 p.m. must be settled by 5.30 p.m. on the same day.

Saturday : Deals transacted before 11 a.m. must be settled by 12 p.m. on the same day.

(ii) *Standard/Tom/Forward value dates:*
Mon-Fri : All settlement by 11 a.m. on the value date.
Saturday : Saturdays are not value date for such transaction.

f. Pricing Policies

BNM charges RM2.50 per single IFTS transaction and RM1.00 per single SSTS transaction. To name a few, other charges include RM2.00 for a central host enquiry; RM2.00 for administrative message; RM100.00 as a cancellation fee for aborted new stock issue; and RM150.00 fee for a replacement of a smartcard. All these charges are on a per transaction basis. In addition, BNM also charges RM5, 000 per member as an annual charge to the RENTAS system's participants.

g. Management of Risks

The trend in recent years has been towards bilateral settlement in Central Bank money on a gross basis, that is, settlement of individual transactions across the accounts held by the participants with the Central Bank. Such a mode of payment or RTGS ensures immediate finality for each and every payment. RTGS systems have become the most common means of controlling risks associated with large value payments in developed financial markets. BNM adopted the RTGS system in July 1999 to replace SPEEDS' end of day net settlement system.

RENTAS is concerned with reducing credit, settlement and systemic risks. While the mechanics of individual systems may vary, an RTGS system is characterised by the requirement for immediate and final bilateral settlement between transacting parties. In an RTGS system, the time lag that would allow for settlement failures due to credit and settlement risks would be eliminated. The system also improves market transparency. As settlements are done bilaterally, it is possible to identify market players and monitor unusual developments.

RENTAS is basically a host computer located at BNM to which all participating financial institutions are linked via COINS (Corporate Information Superhighway, a broad bandwidth operated by Telekom Malaysia Berhad - a telecommunication company). Payment instructions are relayed electronically to the host computer, which effects the corresponding accounting entries on a real-time basis. These payments can only be effected provided the paying institutions have sufficient funds in its accounts or has

adequate collateral lodged with the system to avail itself of intraday credit provided by BNM. In the event the paying institution does not have adequate funds or securities, the transaction will be queued, pending the availability of funds and/or securities. To minimise 'gridlock' situation, BNM ensures liquidity available, for instance, drawing down on statutory reserves within the permissible banks. The processing, transfer and settlement of interbank funds and scripless securities transactions take place in real-time and simultaneously. The transfers are effected on a gross basis (i.e. without netting debits against credits) and provide finality (i.e. payee banks are able to receive funds with certainty for individual transfers).

RENTAS also contributes to the reduction of settlement risk in scripless securities transactions by providing a mechanism for DvP. This mechanism enables transfer instructions for both scripless securities and funds to be effected on a trade-by-trade basis, with final (unconditional) transfer of the securities from the seller to the buyer (delivery) occurring at the same time as the final transfer of the funds from the buyer to the seller (payment). Besides reducing the settlement risk for interbank funds transfers, the RENTAS System can help to reduce the risks in exchange for value settlement systems such as those for securities settlements.

The present settlement system of the Malaysian Stock Exchange, KLSE, complies with internationally accepted practices where DvP is employed as the method of clearing, delivery and settlement for all securities transactions. The DvP environment was further enhanced by the implementation of the Institutional Settlement Service (ISS) for direct business transactions in July 2001. The ISS for on-market transactions was first introduced in July 1999 to enable eligible financial institutions to clear and settle securities transactions on behalf of their institutional clients directly with SCANS and achieve DvP. Since the introduction of ISS, the clearing and settlement of on-market transactions for institutional investors have been enhanced significantly. ISS reduces the settlement risk exposure of institutional investors whilst enhancing the DvP environment in line with international settlement best practices and requirements. The implementation of ISS for direct business transaction is indeed a significant step in ensuring local and foreign institutional investors continue to have access to a secure and efficient clearing and settlement system. The KLSE has also successfully shortened the settlement period from T+5 to T+3 in December 2000, standardising the local settlement time frame with that of internationally accepted G30 standard of final settlement of T+3. A central guarantee fund for SCANS was established in 2001 to provide the necessary resources for ful-

filling its clearing and settlement obligations in the event of a default or collapse of a trading clearing member.

In addition to managing risks, BNM also has contingency site set up in "hot standby" mode, with continuous transfer of data from the prime site, so that in the event of a breakdown, processing can resume in a matter of hours. All participants have also been advised to have a back-up site. Additionally, business continuity arrangements that include a "minimum level of service" to be offered, in circumstances of severe disruption, are also in place for the RENTAS system. The contingency approach adopted by BNM will ensure that the critical payments in the country would not be disrupted.

2.1.3.2 Image Based Cheque Clearing System

Unlike RENTAS, *Sistem Penjelasan Imej Cek Kebangsaan* (SPICK – National Cheque Image Clearing System), deals with retail payment clearing.

BNM implemented a new system using imaging technology for cheque clearing, SPICK, in a phased approach, which began in November 1997. The new system is a combination of the automated cheque clearing system with the imaging of inward cheques for purposes of examination and verification of signatures by the Head Office and respective Regional Offices of the paying banks. Data on the inward cheques (the Magnetic Ink Character Recognition - MICR line) are transmitted to the paying banks, followed by images of the cheques in a CD format. The benefit is that the banks are able to process and verify the cheques based on the data and CDs received, without having to sight the physical cheques.

The objectives of SPICK include providing same day clearing for all local cheques banked in before 2.00 p.m., extending the coverage of the local zone, reducing the day-hold for outstation cheques to a maximum of five days, and reducing the handling and movement of physical cheques. In line with this development, the Bills of Exchange Act 1949 was amended to incorporate a provision on cheque imaging to recognise the presentment of a cheque for payment through a document image processing system.

Besides the normal cheques, SPICK also processes other clearing items such as bankers' acceptances, cashier's orders, demand drafts, interest warrants, pension warrants, drawing vouchers and ringgit travellers' cheques.

There are three regions in West Malaysia under the new system. Phase I of SPICK was launched in the towns of the KLACH[5] Zone in November 1997. It was extended to the Southern (SPICK-JB) and Northern (SPICK-PP) regions (i.e. Phase II of SPICK) in September and December 1998 respectively. Phase III, which is scheduled to be implemented in the coming future, will cover the non-SPICK areas. Non-SPICK areas include the states of Kelantan, Terengganu, Sabah and Sarawak. These areas, which are not covered by SPICK, undertake manual clearing. The average daily volume of transactions in these areas is estimated at around 70,000 cheques, whereas, for the SPICK-KL zone, it is around 450,000 cheques daily. SPICK-JB and SPICK-PP process up to 50,000 and 70,000 cheques respectively.

a. Participants in the System

All the commercial banks in Malaysia that provide checking facility to their customers are the participants of the SPICK system. Currently, there are 13 domestic banking institutions (which include 2 Islamic banks) and 14 locally incorporated foreign banks that provide checking service to their customers.

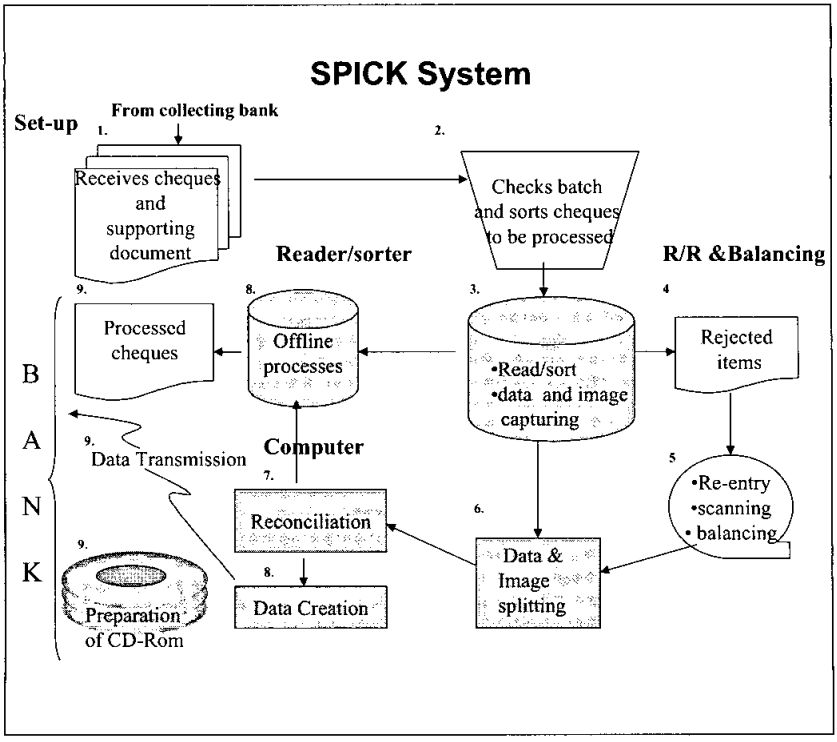
b. Types of Transaction Handled

SPICK handles cheque-clearing processes using imaging technology. In addition, the system also processes other clearing items such as bankers' acceptances, cashier's orders, demand drafts, interest warrants, pension warrants, drawing vouchers and ringgit travellers' cheques.

c. Operation of the System

In the SPICK regions, as mentioned earlier, all the processing of cheques is done using imaging technology. Whereas, in the non-SPICK regions, the clearing process is still manual.

5. KLACH – Kuala Lumpur Automated Clearing House: An automated cheque clearing centre for the Kuala Lumpur region prior to the set up of SPICK system.



Box 6: The operations of SPICK system.

The operations of SPICK-KL:

1. *Reception/Set-up*

Cheques from various banks in the SPICK area are delivered to the reception area of SPICK before 6.00 p.m. in a sealed envelope with an attached PIS (Pay in Slip). A copy of PIS is returned to the bank(s). The sealed envelope is then delivered to another section of SPICK called 'Set-up'.

2. *Set-up*

The sealed envelope will be opened and the cheques, which are bundled, are processed. Each bundle will have a batch ticket. The batch ticket is to credit the collecting bank(s) with the total amount of the bundle, whereas the cheques represent the debit entry for each paying bank. Each bundle will be inspected for its MICR code, cheques arrangement and batch

ticket before the bundle is placed into a tray to be sent for processing. The cheques are sent to 'UT Machine' for processing.

3. *UT Machine (On-Line)*
   Cheques received are placed into input tray of the processing machine. MICR data will be captured as well as the image of the cheques. Items or cheques that are not readable by the machine will be rejected into a slot in the machine called reject items hole. These reject items will be sent to 'Reject/Balancing' section for manual processing and data input.

4. *Reject/Balancing*
   Non-readable items/cheques are sent to the manual input. The section is responsible to ensure that each credit amount of batch ticket tallies with its debit amount of each cheque sent. At the end of the day, the section is responsible to ensure that the total credit amount of batch tickets tallies with the total debit amounts of cheques sent for clearing before the next process is executed.

5. *Computer Room*
   This is where the data is being processed. It is then transmitted electronically to commercial banks via FINET (Financial Institution Network) line. The physical data (i.e. Data in CD-ROMs and cheques) is sent to the banks at a later stage.

6. *UT Machine (Off-Line)*
   After the on-line processing is completed, the UT Machine section will sort the cheques electronically according to the banks. The sorted cheques will be sent to Reception/Set-up section for delivery to commercial banks for verifications. The cheques are then ready for collection by respective paying banks.

d. Volume of Transactions Handled

Since the set up of SPICK system in November 1997, the volume and value of cheques processed through the system has been increasing. For example, in 1998, about 105 million cheques valued at RM739 billion were processed. The figures for 1999 increased to 154 million cheques valued at RM1, 007 billion, or a growth of 47% in number of cheques and 36% in the value processed over the previous year.

e. Settlement Procedures

The settlement of cheque clearing among the banking institutions are carried out on a multilateral net basis across the clearing accounts held at BNM. Upon conclusion of the settlement, the net balances of each bank will be debited or credited as the case may be, to the current accounts of the banking institutions maintained with the Central Bank. The clearing system is based on end of day deferred net settlement.

f. Pricing Policies

BNM charges the banking institutions RM0.06 per inward clearing item in the SPICK system. Other charges include RM1.00 per unpaid item, and also RM0.05 per CD-ROM for the image stored of the physical cheques that were processed. For reject items, the banking institutions will be charged RM2.00 per item.

g. Management of Risks

Basically, a DNS system has two main risks, namely, liquidity and credit risks. Like any other clearing system, which involves large value, whether in isolation or combination, it can consequently lead to systemic risk. As the lender of last resort to the financial institutions, BNM is directly involved once systemic risk threatens the system to provide the liquidity to restore stability. Like RENTAS, SPICK is also considered as a critical system. In order to address any operational risk that can be associated to the system, BNM has contingency site set up in "hot standby" mode, with continuous transfer of data from the prime site, so that in the event of a breakdown, processing can resume in a matter of hours. All participants are also advised to have such an arrangement. Additionally, business continuity arrangements that include a "minimum level of service" to be offered, in circumstances of severe disruption, are also in place for the SPICK system. In addition, legally enforceable system rules and regulations are factors to manage any legal risk in the operation of the system. In SPICK, all participants are subject to the operational rules of the system that were established jointly with the Association of Banks in Malaysia.

2.2 Cross Border Payments

2.2.1 General Overview

In Malaysia, international transfers of both small and large value payments are mainly handled by the banking institutions. In addition to credit card transactions or card payments, the postal service also has a role in the community to provide small-value international payments, through its international remittance services. Nevertheless, the Central Bank does not regulate the payment systems of the postal agencies. BNM and most of the banking institutions are members of the SWIFT network system and this enables them to initiate and receive international payment messages.

2.2.2 Payment Methods

2.2.2.1 Cross Border Payments

S.W.I.F.T. or Society for Worldwide Interbank Financial Telecommunications is an international transaction-processing network owned by and serving the financial community worldwide. It provides a computer-controlled system for transmitting messages throughout the world. It is an independent processing network set-up to enable secure and rapid transmission of fund transfers or other messages between financial institutions worldwide. It covers most international financial functions such as customer transfers, bank transfers, foreign exchange confirmation, credit/debit confirmations, statements collection and documentary credits. The Malaysian banking system joined the SWIFT system in March 1989, while BNM commenced using SWIFT facilities in June 1989.

2.2.2.2 International Retail Payments

The most common means of making retail payments internationally is by the usage of payment cards such credit, debit and charge cards. Credit card transactions are routed through the international card associations (such as Visa and MasterCard) for clearing between the domestic issuing bank and the overseas acquiring bank or vice versa, as may be the case. In terms of debit card, the international brands such as the Visa Electron and MasterCard Electronic (provided by Visa and MasterCard respectively) are the most commonly used overseas. In addition, the charge card is another form of payment mechanism frequently used for overseas transactions. Due to its wide acceptance in the major cities in the world, brands like Ameri-

can Express, Diners Club, and JCB Card International are the most common charge card brands.

2.2.2.3 Travellers' Cheques

Travellers' cheques are also a common mode of payment abroad for Malaysians. These cheques can only be bought through the banking institutions. However, travellers' cheques can also be encashed at the moneychangers, besides the banking institutions.

2.2.2.4 International Postal Remittance Services

Pos Malaysia Berhad, the postal agency in Malaysia, provides postal remittance services such as the International money order. It is a convenient and reliable facility for remitting money overseas.

3. The Implications of the Existing Payment and Settlement Systems for Financial Stability

3.1 Monetary Policy

The payment system is an integral component of financial stability that facilitates transactions. When the system fulfils this role effectively, it also produces three important spin-off effects. Firstly, it promotes public confidence in the financial system. Secondly, it improves the efficiency of the financial system and, by extension, the economy as a whole by ensuring payments are transacted promptly and efficiently. Finally, it provides special benefits to Central Bank by facilitating the conduct of monetary policy by allowing greater use of market-based instruments to achieve desired outcomes.

BNM is entrusted with the responsibility for the formulation and implementation of monetary policy to attain price stability. To achieve this objective, a key element is to ensure an efficient monetary transmission process. An efficient and reliable payment systems can be a factor of this.

BNM will continue to enhance the payment systems in order to create efficient, secure and reliable payment systems that will support effective implementation of the monetary policy. For instance, the payment systems policy will affect the distribution and circulation of money that will in turn contribute to the formulation of the monetary policy. Moreover, improving

the trading, payment and settlement arrangements is one of the strategies that the Central Bank is embarking on order to facilitate the transition, whereby monetary policy implementation procedures have evolved significantly towards a more market-based system.

BNM undertook measures to improve trading, payment and settlement arrangements to reduce the potential problems created by the handling of large volumes of securities, as well as the settlement lags, thereby, enabling a larger volume of transactions to be undertaken.

BNM has a wide range of measures that could be used for implementing the monetary policy. The main instruments include the Open Market Operations (OMO), direct intervention by BNM to borrow or lend in the interbank money market, the issuance of BNM papers, variations in the Statutory Reserve Requirement (SRR), and also selective credit and administrative measures.

In a globalised economy, monetary policy would be conducted more and more through market-based instruments. Since monetary policy operates through the financial system, current moves to strengthen the banking system and to make it more efficient would also enhance the effectiveness of monetary policy. The development of a deep bond market would allow BNM to undertake more effective OMO and this would allow it to reduce its current reliance on the more direct instruments of monetary policy such as the SRR. The evolution of the economy and financial system, the accompanying financial innovations and the emergence of new payment mechanism like 'e-money' would also have an impact on the way monetary policy is conducted. In view of the rapidly changing environment, the monetary policy framework would be adapted accordingly to ensure that monetary policy remains an effective policy instrument for promoting economic growth.

3.1.1 Timely Information

The payment systems may provide timely information for contributing to the implementation of monetary policy. For instance, in terms of settlement procedures, money transactions during the tendering process or transactions in the open market operations are settled in the counterparties' accounts with BNM, which is conducted through the RENTAS system. Since the RENTAS consists of two sub-systems, i.e. IFTS and SSTS, transaction in securities, which are conducted through the SSTS, can only be finalised

when both securities and funds are available, based on the 'Delivery versus Payment' system. In the case of money market transactions involving direct borrowing/lending, which are conducted through the IFTS, the settlement will be processed based on the real time gross settlement system.

RENTAS system permits inquiry of positions by BNM and financial institutions. Participants of RENTAS are allowed to monitor, in real-time, incoming and outgoing payments. The introduction of RTGS will demand active intraday liquidity management. Banks and their customers will give greater attention to the scheduling of their payments and the control of intra-day credit exposures.

With the establishment of RENTAS since July 1999, information on the liquidity of the banking institutions from their settlement accounts will enable the Central Bank to conduct monetary policy in an effective and efficient manner. The 'real-time' nature of the system enables the banking institutions to manage their liquidity position and thus, lead to better operation.

3.1.2 Effective Conduct/Implementation of Monetary Policy

It is viewed that inefficiencies and delays in the payment and settlement systems may distort variables that determine the conduct of the Central Bank's monetary policy. One of the variables concerned is the availability of liquidity. The availability of current and updated information on liquidity conditions is essential as value of monetary aggregates is used as indication to formulate monetary policy.

The mechanism in the payment and settlement system must also be efficient and effective. Fast and accurate transmission of funds and information, such as lending rates, credit availability, availability of government securities, are vital for the implementation of a timely monetary policy. For example, BNM provides intra-day liquidity, subject to the availability of collateral, to the participants of the RENTAS system. The repayment of the intra-day credit is automatic within the same day.

With modern financial infrastructure, like the RENTAS system, risks associated with the previous system could be minimised or even eliminated. An RTGS system is the most common means to eliminate payment and settlement related risks. Lesser risks relate to better management of settlement system and hence, better equipped for the conduct of monetary policy.

3.2 Payment Systems Oversight

Robust payment systems are essential for maintaining financial stability. Payment system failures can disrupt financial stability if there is no ready alternative means of making payments. Should agents not be able to effect payments for one reason or another, it can result in destabilising consequences for the financial system. Thus, BNM has always accorded significant attention to the design and operation of, and oversight over the payment system. However, recent developments in the financial system and technology demand that Central Banks' play an even more active role. In addition to prudential and regulatory reasons for greater Central Bank oversight, the increasing complexity and interconnectedness of the global financial system brings new risks.

BNM performs its oversight functions including overseeing the payment systems in the country as part of its overall responsibility in regulating and supervising the banking system. The oversight function is conducted through various means including on and off site supervision, issuance of guidelines and through moral suasion.

While there is currently no single payment systems act governing payment systems in Malaysia, BNM is empowered under the Banking and Financial Institutions Act 1989 (BAFIA) to regulate the operations of electronic fund transfer (EFT) systems. According to Section 119 of the BAFIA, the prior approval from BNM is required to operate any electronic fund transfer system. Applications to BNM for consideration should provide the scheme of operation of the system and the rules, contracts, by-laws or other documents relating to the rights, duties and liabilities of the persons participating in the system. In addition, Section 19 of the BAFIA requires the operator of credit token business, which is defined to include credit and charge card system to obtain the prior approval of BNM. The BAFIA also empowers BNM to inspect the premises, equipment, machinery, books or other documents, accounts or transactions relating to the system. The other statute law, which relates to payment services in Malaysia, is the Bills of Exchange Act 1949.

Payment system oversight is essential as BNM views that a reliable and efficient payment system contributes to financial stability. The condition of the payment system and the usage of payment instruments are a concern to the Central Bank, as this will effect the public confidence on the reliability and security of the systems and thus, the prosperity of the economy.

In addition, payment system oversight is aimed at safeguarding the transmission channel for monetary policy, as payment systems are an essential vehicle for the implementation of monetary policy.

3.3 Competition/Innovation

In Malaysia, the wholesale payment systems in Malaysia are currently operated by BNM. BNM is empowered under the CBA 1958 to establish clearing houses in Kuala Lumpur and in such other places as the Bank may consider necessary. The real-time gross settlement system, RENTAS, and the cheque clearing system, SPICK, operated by BNM are open to all licensed banking institutions in Malaysia. With regards to the retail payment systems, MEPS, owned by a consortium of domestic banking institutions operate most of the retail payment systems in Malaysia. In terms of BNM's policy on particular operational banking practices by certain banks, BNM intends to review it in order to increase the efficiency and competition in the payments system. Policies relating to introduction of new payment systems as well as access to existing payment systems would be reviewed in line with this. In recent years, access to the systems operated by MEPS, such as GIRO and the Internet Payment Gateway, was expanded to the foreign banks,

In normal business environment, 'healthy' competition is considered to be good for the running of a business. In banking, competitions among the banking institutions is in terms of the banking products that are offered, the level of services being rendered to the public and also the level of flexibility in the banks' facilities, to name a few. BNM allows competition of these forms provided there is no abuse of the banking practices. As a result, due to the growing needs of the customers, a competitive environment will lead to banking institutions introducing new banking products such as phone banking, internet banking, on-line services, chip based payment cards and others.

In respect to the globalisation and the rapid advancement in payment technology, nevertheless, the 'true' competition for the banking sector comes from the non-banks. These entities are rapidly introducing new banking products and for retail payments, at times they may appear to be a threat to the banking institutions themselves. The new technology has essentially resulted in the convergence of products and services, blurring the lines between banking and non-financial institutions and bringing significant changes to the global financial markets. Nevertheless, if a party has the intention to

develop and introduce an electronic funds transfer system in the country, there is a provision in the BAFIA that states the requirement for such a party to seek BNM's authorisation in order to operate any electronic funds transfer system.

Information technology (IT) has played an enormous role in meeting new challenges, as well as permitting banking institutions to fulfil increasingly complex customer demands. The use of IT facilitated the introduction of more creative products and services in achieving a competitive advantage. Electronic banking and the use of electronic cards for transactions are some of the innovations that have been made possible through the application of IT. Electronic home-banking delivery services enable the commercial banks to provide convenient banking services, while keeping in mind the concerns surrounding security, affordability and convenience of the whole process.

In respect to introduction of new payment product/systems, some parties have viewed that BNM would be restricting innovation if it were to impose strict limitations on any party that intend to do so. Agreeing to the fact that new products enhance innovation, nevertheless, as a Central Bank, it is the role of a regulator to ensure that any payment systems in the country should be secure and reliable. In particular, although technological innovation enhances profitability and transaction convenience, it also creates new kinds of risks and increases the degree of risk involved, thus, making coordination with private payment systems all more important. Due to this, BNM will continue to monitor the development of the payment systems and will review any of its payment systems policy in the future or when the need arises.

4. Consumer Protection

In Malaysia, BNM plays its role in requiring banking institutions to enhance consumer awareness as well as addressing consumer protection issues in the provision of their services. Recognising the need to address banks' customer complaints, BNM had also played a role in the setting up of a Banking Mediation Bureau in 1996 to provide a simple mechanism for dispute resolution without any cost to the customers of the banks or finance companies in Malaysia. The Bureau receives references from consumers who are not satisfied with the decisions of the banks or finance companies on their complaints or claims involving monetary loss as a result of their dealings with them. Amongst the complaints or claims involving mon-

etary losses entertained are the charging of excessive fees, misleading advertisement, ATM withdrawals and unauthorised use of credit cards.

BNM has issued a guideline on consumer protection specifically relating to electronic fund transfers entitled, "Guidelines on Consumer Protection on Electronic Fund Transfers". The purpose of these guidelines is to provide a basic framework to establish the rights, liabilities, and responsibilities of customers and financial institutions relating to electronic fund transfers.

A crucial aspect of stability in the financial system relates to its ability to undergo the transition to deregulation and increasing competition without resulting in disruption in the level or reliability of services to consumers. The need to protect consumers from potential unfair practices by banking institutions specifically in providing payment system products will continue to be one of the main areas of concern.

In addition, electronic payment systems or modes hold tremendous potential for consumers, but they also pose risks. In order to become a part of consumers' everyday lives, electronic money must be widely accepted, convenient, and secure. In respect to consumer protection issues, consumers will accept payment systems only when they are confident that these systems offer safety and security. Electronic money presents a wide array of consumer protection issues. Among the most critical include, liability for unauthorised use and dispute resolution procedures; privacy; and availability of these new payment systems to 'under-served' populations. As a regulator, BNM considers the enforcement challenges posed by the growing international dimensions of some payment systems.

5. Recent Payment System Developments and Policy Initiatives

BNM plays a major role together with the banking institutions, in the development of the payment systems in Malaysia. In the development of retail payment infrastructure, MEPS took the leading role to set up some of the retail payment systems since its formation in 1997. Some of the payment systems developments are listed as the following:

5.1 Legal Framework

In line with the recommendation in its Financial Sector Master Plan, BNM is in the process of formulating a flexible, proactive and effective

regulatory framework for the payments system to be adopted in its oversight of the payments system. In ensuring the smooth functioning of payment and settlement systems, BNM would adopt a regulatory framework that seek to promote the safety and efficiency of the payment and settlement systems and to safeguard the interests of consumers. The framework would enable policies relating to payment and settlement systems to be efficiently implemented by the central bank. These policies would strengthen the payment systems as well as complement other initiatives taken by BNM in subscribing to a more-supervised market approach. The framework would promote fair access and greater price transparency in the provision of retail services as well as encourage co-operation in the development of payment systems. In June 2000, BNM has launched its Internet banking guidelines for the banking industry, which sets among others, the requirement for security and transparency. In addition, when Malaysia launched the Multimedia Super Corridor (MSC) in 1996, the Government committed itself to laying down a legal framework for e-commerce and the Internet. The cyberlaws introduced that would instill confidence and encourage the public to conduct electronic transactions included the Computer Crimes Act 1997, the Digital Signature Act 1997 and the Communications and Multimedia Act 1998. In addition, the Government is enacting new laws including the Personal Data Protection Act and Electronic Transactions Act.

5.2 Integration and Linkage of System Networks

MEPS, since its establishment in 1997, had initiated several projects to facilitate the sharing of payment systems infrastructure among its member banks. The Nationwide Payment and Clearing System (NPCS) implemented in June 1999 provided a backbone infrastructure for the switching, clearing and settlement for shared ATM, interbank GIRO, EFTPOS services, payment EDI, and credit, debit and e-cash transactions. The NPCS system will encourage the usage of electronic –based payment mechanisms and improve the clearing of miscellaneous banking transactions, which are small in value but large in terms of volume. The system provides various benefits to the banking system as well as the banking public, in terms of paperwork, processing cost and speed. In addition, MEPS had also developed an e-commerce payment gateway to process card-based payments for its member banks. E-commerce payment gateway is able to handle both SET and SSL protocols. It facilitates electronic commerce since its open network architecture enables it to be interfaced with other networks, including the Internet.

There are also plans in BNM to further integrate the various domestic payment systems in Malaysia including interfacing the real time gross settlement with the securities settlement system to increase the efficiency of securities settlement as well as to reduce settlement risks.

5.3 RTGS System for Large Value Interbank Funds Transfer (RENTAS)

In July 1999, Real-time Electronic Transfer of Funds and Securities (RENTAS) was implemented. The system is an RTGS system for a high-value interbank funds transfers and scripless securities. This new system replaced the previous system, SPEEDS, which settled on an end-of-day net settlement basis. (Please refer to Section 2.1.3.1 for details explanation on the developments of RENTAS system).

5.4 National Smart Card Scheme

MEPS has introduced an e-purse scheme called MEPS Cash in September 1999 at selected suburbs in Kuala Lumpur. Another development was the introduction of Payment Multipurpose Card (PMPC). The PMPC will be introduced in January 2002, whereby MEPS will handle the development of the PMPC and provide a common platform and infrastructure for its implementation. In April 2001, Malaysia created history by becoming the world's first to launch a Government Multipurpose Card (GMPC) incorporating multiple applications. MyKad, which stores biometric data on an in-built computer chip, is the first national smart card scheme of its kind in the world. MyKad, which is compulsory for Malaysia's citizens, will be issued to 20 million Malaysians by 2007. MyKad integrates multiple Government applications (national identity card, driving licence, immigration and medical information) and 3 non-Government applications (e-purse scheme 'MEPS Cash', ATM application and a digital signature application based on PKI) on a single technology platform. Since April 2001, 600,000 cards have been issued and the figure is expected to reach two million by next year. The Payment Multipurpose Card will be introduced in January 2002, whereby MEPS will provide a common platform and infrastructure for its implementation. In addition, an electronic bill payment service via kiosks, which accept payments via Visa and Mastercard credit cards, ATM cards of participating banks and MyKad, was also introduced during the year. This service covers payment of utility bills as well as prepaid uploading.

On the national e-money scheme or MEPS Cash, the project was undertaken jointly by MEPS and the banking institutions on a commercial pilot basis in Bangsar, a suburb in Kuala Lumpur. It uses 'Proton' technology and does not allow card-to-card transfers. The maximum amount that may be loaded is RM500. The card can be used for retail purchases of goods and services. The cards are reloadable over the counter at participating bank branches or through unattended loading devices. The MEPS Cash card is currently available as a standalone card in two forms, reloadable and disposable. The scheme is operated by MEPS with current participation from 6 banking institutions. MEPS and the participating banking institutions are presently taking steps to extend the implementation of MEPS Cash beyond the commercial pilot area. Wider acceptance of MEPS Cash is also being explored to include other sectors such as transportation (for payment of tolls, fares for buses, trains and LRT) and telecommunication (for use in public telephones).

Other smart card initiatives include migration of magnetic stripe ATM and credit cards to chip-based cards. Banking institutions are expected to complete the migration of their ATM cards to chip-based cards by January 2003, whilst the nationwide chip migration of magstripe credit cards is still in the planning stage. Besides from combating card fraud, the main rationale to migrate to chip is to upgrade the whole card system to a more reliable and secure card payment system.

5.5 Internet Payment Gateway

With regard to electronic payments via the Internet, MEPS had launched its Secure Electronic Transaction (SET) payment gateway nationwide on 22 March 1999. The gateway provides infrastructure for Internet payments using the SET protocol. All domestic purchases or payments via the Internet can be made using credit cards or SET digital certificates, which may be obtained from the participating banks. The system was developed and operated by MEPS. Currently, a total of 7 banking institutions (including foreign banks) are using the system.

5.6 Interbank GIRO (IBG)

IBG was launched by MEPS in April 2000. Currently, 11 financial institutions participate in the system. The IBG system is to facilitate electronic interbank payments for third party transactions of less than RM50, 000, which are not accepted by the RENTAS system. These transactions typi-

cally relate to standing instructions for loan repayments, payment of insurance premiums, salaries, income tax payments, EPF contributions and others. The service involves a daily exchange of digitised transactions through MEPS IBG system, allowing financial institutions to transmit payment instead of using the conventional bank drafts and cheques. This will reduce the time of crediting the amount to a consumer's account, especially an outstation account and there will be no more extra paper work and cheques to process. MEPS is planning to enhance its IBG system to a web-enabled system to facilitate e-commerce.

5.7 Internet Banking

To govern the provision of banking products and services over the Internet, BNM issued the "Minimum Guidelines on the Provision of Internet Banking Services by Licensed Banking Institutions" in June 2000. Under the Guidelines, the Board of Directors and senior management of the banking institutions are entrusted with the responsibility of ensuring the feasibility, safety and integrity of the Internet banking activities that would pose risk of serious loss to depositors. The Guidelines include requiring banking institutions to put in place an effective and comprehensive risk management framework, Internet banking security policies, safeguards and administrative requirements for outsourcing, advertisements, web link arrangements, strategic alliances or partnerships, human resource requirements including training programmes, proactive consumer protection programmes and a Client Charter on Internet banking. Banking institutions are free to adopt more stringent measures and are expected to keep abreast not only with technological developments but also the needs of their customers. During the year, a total of eight domestic banks launched transactional Internet banking services. Virtually all of the banks that offer electronic services allow customers to perform account balance inquiries and statement request, request for stop cheque payments and new cheque books, remit payments and transfer funds among accounts and have access up-to-date information. More sophisticated systems allow customers to apply for loans and perform online share trading.

5.8 Enhanced Cheque Clearing System

BNM had implemented a system using imaging technology for cheque clearing in the Central, Northern and Southern areas, since November 1997. The system, SPICK, is a combination of the automated cheque clearing system with the imaging of inward cheques for purposes of examination and

verification of signatures by the Head Office and respective Regional Offices of the paying banks. Data on the inward cheques (the MICR line) are transmitted to the paying banks, followed by images of the cheques in CD format. The benefit is that the banks are able to process and verify the cheques based on the data and CDs received, without having to use the physical cheques. The objectives of SPICK include providing same day clearing for local cheques, extending the coverage of the local zone, reducing the day-hold of outstation cheques to a maximum of five days and reducing the handling and movement of physical cheques. Currently, BNM is planning to improve its cheque clearing services in the non-SPICK areas that is the states in the East Coast and East Malaysia. The viability of adopting cheque truncation to reduce the number of day-holds in these areas is being assessed.

5.9 Electronic Funds Transfer at Point of Sale

MEPS has implemented a switching network for domestic debit card schemes. With this service, ATM cardholders of participating banks would be able to pay for purchases using their payment cards at participating merchants regardless of the acquiring bank through MEPS. MEPS will provide the central switching system to support the interbank debit ePOS transactions between the participating issuing and acquiring banks. Debit ePOS is not entirely new in Malaysia. Some banks are already offering such a service to their ATM cardholders on a proprietary basis whereby cardholders are only able to conduct debit transactions at merchants acquired by their respective banks. Debit ePOS is ideal for payments at retail outlets such as supermarkets, department stores, convenience stores and petrol stations as well as for paying utility bills. In addition, the introduction of MEPS Cash will provide a wider alternative for ePOS transactions.

5.10 Payment EDI

In Malaysia, Dagang Net Technologies Sdn. Bhd. (DNT), a service provider, handles some 48 million electronic transactions annually and RM4.7 billion customs duty payment since 1996. In order to improve the efficiency of customs duty payment, DNT implemented Electronic Multi-Payment Gateway (e-MPAG) for the transmission of EDI messages for payment processes. Under the system, agents are able to make one single payment of customs duty for the release of multiple consignments. Supported by nine local banks, customs duty payments are made electronically via the e-MPAG through the use of smart cards and other security devices between the forwarding agents and participating banks.

5.11 National Payment Advisory Council (NPAC)

In 1993, the Bank established a National Payment Systems Council (NPSC) as a main body to provide guidance and leadership in the development of national payment systems. In 1994, the NPSC formulated a National Payment Systems Masterplan, targeted for the period 1995 -1999. The Masterplan provided the overall direction for the development of the country's payment systems. NPSC has been inactive since 1996 as BNM was of the view that the implementation of some of the critical measures identified in the Masterplan would only involve the domestic banking institutions.

Nevertheless, in a rapidly changing payment systems environment that we are dealing today, BNM views that the establishment of an advisory council called the NPAC is necessary and timely. While other countries may call it differently, the general approach adopted by various countries is to form a forum or committee to jointly address various issues on payment systems. The vast technological changes and extensive development of payment systems worldwide make it important to have a body that gathers regulators and players of the payment systems to provide market input and advise on matters relating to payment systems in the country.

In May 2001, the NPAC was formed. BNM chairs the body and the members consist of associations of banking institutions, association of insurers, regulator of securities industry, government agencies, MEPS and international representatives. The objectives of NPAC include the following:

- to act as a reference body and provide advisory function in matters relating to the payment systems in the country; and
- to act as a body to provide market input in developing payment systems policies aimed at promoting efficiency, while ensuring the stability and integrity of the financial system.

5.12 Projects Currently Undertaken by Bank Negara Malaysia

There are also other payment systems initiatives that are being undertaken by BNM at this stage. These include Payment Systems Framework; Cheque clearing processing for Sabah/Sarawak/Kelantan/Trengganu (non-SPICK areas); and Internet enabled payments.

6. Suggestions and Recommendations on the Role of the Central Bank in Ensuring the Safety and Efficiency of the Payment and Settlement System

The following proposals are taken from some of the recommendations outlined in the Financial Sector Masterplan and Capital Market Masterplan, which were issued by BNM and SC respectively, with the objectives among others, of improving efficiency, innovation, flexibility, resilience and dynamism in the payment systems in Malaysia.

6.1 Encourage the Development of New Delivery Channels

Innovative and more efficient delivery channels such as Internet and mobile phones will become an increasingly essential part of a modern banking system. It will offer banking institutions significant advantage in customer retention, customer acquisition and service cost reduction. Skills and brands can be developed and promoted through these channels, which have been important for success in other high technology services such as TV banking. Services such as Internet banking offer a unique value proposition to consumers and are growing fast globally. The Internet improves accessibility to banking products and services, and can be harnessed not just as mere delivery channels, but as new business ventures through the setting up of virtual banks by banking institutions.

In this regard, BNM should allow and encourage banking institutions to embrace these innovative approaches. At the same time, minimum standards will be imposed to ensure that such innovations do not compromise financial stability and integrity. Thus, its regulatory framework will balance the various trade-offs between efficiency and financial system stability.

6.2 Increase Efficiency and Competition in the Payment Systems

Going forward, the efficiency of the payment systems should be enhanced to support the needs of the financial system. The financial system would require a payments system that is capable of facilitating settlements between various financial players and for various types of instruments in the market. In this regard, BNM in its oversight of the payment systems should adopt a flexible, proactive and effective regulatory framework for the payment systems. The framework should seek to improve the efficiency of the payment related infrastructure, while maintaining the safety and integrity of the payment systems.

6.3 Allow Market Forces to Shape Developments in the Payment Systems, while Bank Negara Malaysia Assumes the Role of a Regulator

As the payments technology and the structure of the financial services industry are changing rapidly, it would be more efficient and effective for market forces to play a pivotal role in the development of payment systems. Allowing greater competition will increase innovation in payment systems, particularly for the retail payment systems. By driving competition further and allowing alternative payment systems and gateways, greater dynamism and efficiency would be encouraged among the existing payment systems providers. Recognising this, BNM should adopt a facilitative rather than a developmental role, especially in the retail payment systems. However, BNM would need to ensure that minimum security standards are met when new systems are introduced.

6.4 Allow Incumbent Foreign Banks to Set Up Shared ATM Network

Currently, the foreign banks individually manage a limited number of ATM machines. The presence of an alternative ATM network operated by foreign banks will drive further dynamism in the traditional payment networks and provide an alternative payment channel for the consumers. In the long run, there is a possibility for the domestic ATM operator, i.e. MEPS to initiate a merger between the two networks to form a single ATM network. While this could be an optimal solution, the decision by MEPS with regard to its future strategies should be based on the business value of the alternatives.

6.5 The Money Settlement System Should be Directly Linked with the Capital Market Trading and Clearing Systems

The integration of the money settlement system, operated by BNM, and the clearance and settlement system of the exchange-traded market could reap major benefits, which include achieving international best practice in several areas. An integrated system would also reduce systemic risk, by introducing finality and certainty to payments. Such integration would require a thorough study on the approaches that may be undertaken. Issues that would require closer attention include proper liquidity management for participants and the clearing house, and the possibility of enhancing the linkages with other foreign systems in the future for cross-border transaction

purposes. In facilitating such integration process, a revised legal framework might also need to be introduced.

6.6 The Facilitation of Electronic Trade Settlement through the Integration of Technologies of the Capital Market Clearing and Settlement System with the Payment System

The development of online trading systems necessitates more direct linkages between the capital market clearing and settlement system and a corresponding payment system to facilitate online transmission of money settlement via electronic links to banking institutions and other payment sources. Currently, online transactions are cleared and settled in the same way as traditionally routed trades using the RTGS operated by BNM. An integrated settlement system will improve risk management across markets through reduction of settlement and default risks while attaining DvP status. This will facilitate efforts to establish STP in relation to achieving a shorter settlement cycle for online transactions. Therefore, efforts should be made to explore the possibility of integrating the current clearing and settlement system into a single integrated payment system.

Annex 1

Country Tables

Table 1. Major events affecting the Payment and Settlement systems

Date	Major Developments
June 1967	Issuance of Malaysian currency
January 1984	Establishment of the Kuala Lumpur Automated Clearing House for automated cheque clearing
June 1989	Commencing usage of SWIFT facilities
December 1989	Implementation of Interbank Funds Transfer System (SPEEDS)
January 1990	Implementation of Scripless Securities Trading System
August 1994	Formulation of a National Payment Systems Masterplan for 5 year period (1995-99)
March 1997	Formation of a payment consortium for banking institutions (MEPS)
April 1997	Integration of ATM network
November 1997	Implementation of image based cheque clearing (SPICK system)
March 1999	Launching of an Internet payment gateway by MEPS
June 1999	Implementation of a nationwide payment and clearing system infrastructure to enable switching, and clearing and settlement by MEPS
July 1999	Implementation of RTGS system (RENTAS) for large value interbank funds transfer
September 1999	Introduction of e-money (MEPS Cash)
April 2000	Launching of Interbank GIRO system by MEPS
May 2001	Formation of a National Payment Advisory Council

Table 2. Selected Country Indicators

	1995	1996	1997	1998	1999
Population(million persons):					
Mid-year population	20.7	21.2	21.7	22.2	22.7
GDP(in RM billion)[1]	222.5	253.7	281.8	283.2	300.3
GDP per capita(in RM)	10,753	11,986	13,006	12,770	13,224
Exchange Rate(against USD)					
Year end	2.54	2.53	3.89	3.80	3.80
Average	2.51	2.52	2.81	3.92	3.80

Source: Bank Negara Malaysia

[1] GDP at current prices

Table 3. Settlement media used by non-banks (at year end) (in RM million)

	1995	1996	1997	1998	1999
Notes and coin	17,479.1	19,031.3	21,433.7	18,246.1	24,780.2
Transferable deposits[2]	34,444.8	41,554.0	41,931.4	35,888.6	48,667.0
Narrow money supply(M1)	51,923.9	60,585.3	63,365.1	54,134.7	73,447.2
Memorandum item:					
Broad money supply (M2)	198,873.3	238,208.6	292,217.1	296,472.0	337,138.2
(M3)	271,948.4	329,707.6	390,809.3	401,459.2	434,590.1

Source: Bank Negara Malaysia

[2] Demand deposits maintained by non-banking institutions

Table 4. Settlement media used by banks (in RM million)

	1995	1996	1997	1998	1999
Reserve balances held at central bank[3]	42,373.8	49,427.4	65,197.7	34,650.5	61,343.6
of which:					
Required reserves[4]	28,083.2	43,175.1	57,184.8	15,154.2	14,480.0
Free reserves	1,809.4	2,462.1	4,552.6	3,041.2	7,193.9
Transferable deposits[5]	2,437.2	3,940.6	27,798.2	2,512.0	2,134.8
Memorandum item: Institutions' borrowing from central bank	n.a.	n.a.	n.a.	n.a.	n.a.

Source: Bank Negara Malaysia

[3] Financial institutions' deposits held at BNM.
[4] SRR maintained by banking institutions was reduced to 10% in February 1998, 8% in July 1998 and 4% in September 1998. Thus, reduced the amount of reserves held.
[5] Deposits held with financial institutions.

Table 5. Institutional Framework (1999)

Categories	Number of Institutions	Number of branches	Number of accounts	Value of Accounts (RM billion)
Central bank[6]	1	7	n.a.	61.3
Commercial[7]:				
Public	-	-	-	-
Domestic	20	1623	n.a.	254.9
Foreign	13	144	n.a.	75.1
Development and Investment banks:				
Public	n.a.	n.a.	n.a.	n.a.
Domestic[8]	12	22	n.a.	25.9
Foreign	-	-	-	-
Special Finance Houses	-	-	-	-

Source: Bank Negara Malaysia

[6] Include 2 overseas representative offices in London and New York
[7] In 1995, the number of commercial banks (domestic and foreign) and branches are 37 and 1,433 respectively.
[8] Domestic merchant (investment) banks

Table 6. Cash dispensers, ATMs and EFTPOS terminals

	1995	1996	1997	1998	1999
Cash dispensers and ATMs:					
Number of networks(year-end)	2	2	1	1	1
Number of Machines(year-end)	2,632	2,851	3,150	3,309	3,904
Volume of transactions(during) (in million)	n.a.	n.a.	n.a.	212.3	235.4
Value of transactions(during) (in RM billion)	n.a.	n.a.	n.a.	49.1	54.6
EFTPOS:					
Number of networks(year-end)	n.a.	n.a.	n.a.	n.a.	n.a.
Number of Machines(year-end)	n.a.	n.a.	n.a.	n.a.	n.a.
Volume of transactions(during)	n.a.	n.a.	n.a.	n.a.	n.a.
Value of transactions(during)	n.a.	n.a.	n.a.	n.a.	n.a.

Source: Bank Negara Malaysia

Table 7. Number of Payment cards in circulation (at year-end, in thousands)

	1995	1996	1997	1998	1999
Cards with a cash function	n.a.	n.a.	n.a	n.a	n.a
Cards with a debit/credit function[9] of which					
Cards with debit function	n.a.	n.a.	n.a.	n.a.	n.a.
Cards with credit function	1,764.3	2,064.7	2,140.4	2,050.0	2,345.2
Cards with a cheque guarantee function	-	-	-	-	-
Memorandum item: Retailer cards	n.a.	n.a.	n.a.	n.a.	n.a.

Source: Bank Negara Malaysia

[9] Overlaps with cards with cash function (e.g. ability to withdraw cash via credit card)

Table 8. Payment instructions handled by selected payment systems: volume of transactions (in thousands)

	1995	1996	1997	1998	1999
Retail:					
Cheque Clearing System (SPICK)	n.a.	96,100	104,800	133,200	154,100
Large Value:					
Interbank Funds Transfer System	n.a.	2,065.2	2,426.6	1,992.0	1,464.7
(i) SPEEDS:					
of which IFTS	n.a.	2,029.3	2,390.4	1,947.3	-
SSTS	n.a.	35.9	36.2	44.7	-
(ii) RENTAS (RTGS)					
of which IFTS	-	-	-	-	1,408.3
SSTS	-	-	-	-	56.4
Post office:					
Postal money orders(issued)	n.a.	n.a.	n.a.	n.a.	n.a.
Postal cheques	n.a.	n.a.	n.a.	n.a.	n.a.

Source: Bank Negara Malaysia

Table 9. Payment Instructions by selected payment systems: value of transactions (in RM billion)

	1995	1996	1997	1998	1999
Retail:					
Cheque Clearing System (SPICK)	n.a.	1,109.9	1,304.7	954.1	1,041.9
Large Value:					
Interbank Funds Transfer System	n.a.	15,977.7	23,421.3	18,078.5	12,414.0
(i) SPEEDS:					
of which IFTS	n.a.	15,738.9	23,069.2	17,663.8	-
SSTS	n.a.	238.8	352.1	414.7	-
(ii) RENTAS (RTGS)					
of which IFTS	n.a.	-	-	-	12,166.0
SSTS	n.a.	-	-	-	248.0
Post office:					
Postal money orders(issued)	n.a.	n.a.	n.a.	n.a.	n.a.
Postal cheques	n.a.	n.a.	n.a.	n.a.	n.a.

Source: Bank Negara Malaysia

Table 10. Indicator of use of various cashless payment instruments: volume of transactions
(in thousands)

	1995	1996	1997	1998	1999
Cheques cleared	n.a.	96,100	104,800	133,200	154,100
Payments by cards					
Credit cards	n.a.	n.a.	n.a.	n.a.	n.a.
Debit cards	n.a.	n.a.	n.a.	350.5	320.1
Charge cards	n.a.	n.a.	n.a.	n.a.	n.a.
Direct debit	n.a.	n.a.	n.a.	n.a.	n.a.
Credit transfers	n.a.	n.a.	n.a.	n.a.	n.a.
Internet payment gateway[10]	-	-	-	-	1.22
Postal money orders	n.a.	n.a.	n.a.	n.a.	n.a.
Postal cheques	n.a.	n.a.	n.a.	n.a.	n.a.

Source: Bank Negara Malaysia

[10] Internet credit card purchases that go through a payment gateway provided by MEPS. Only available beginning March 1999

Table 11. Indicator of use of various cashless payment instruments: value of transactions
(in RM billion)

	1995	1996	1997	1998	1999
Cheques cleared	n.a.	1,109.9	1,304.7	954.1	1,041.9
Payments by cards					
Credit cards	6.37	9.52	12.56	11.11	11.86
Debit cards	n.a.	n.a.	n.a.	0.02	0.02
Charge cards	1.60	1.90	1.92	1.54	1.74
Direct debit	n.a.	n.a.	n.a.	n.a.	n.a.
Credit transfers	n.a.	n.a.	n.a.	n.a.	n.a.
Internet payment gateway[11]	-	-	-	-	0.008
Postal money orders	n.a.	n.a.	n.a.	n.a.	n.a.
Postal cheques	n.a.	n.a.	n.a.	n.a.	n.a.

Source: Bank Negara Malaysia

[11] Figure for this payment mode is included in the total value of credit card transactions.

Table 12. Transfer instructions handled by securities settlement systems: volume of transactions
(in thousands)

	1995	1996	1997	1998	1999
Scripless Securities Trading System[12]					
SPEEDS	n.a.	35.9	36.2	44.7	-
RENTAS (RTGS)	-	-	-	-	56.4

Source: Bank Negara Malaysia

[12] SSTS is an online book entry system for Malaysian Government securities, scripless public debt securities etc.

Table 13. Transfer instructions handled by securities settlement systems: value of transactions
(in RM billion)

	1995	1996	1997	1998	1999
Scripless Securities Trading System					
SPEEDS	n.a.	238.8	352.1	414.7	-
RENTAS (RTGS)	-	-	-	-	248.0

Source: Bank Negara Malaysia

Table 14. Summary of Penetration of Payment Instruments

Penetration of Payment Instruments					
Retail Payment Instrument	**1995**	**1996**	**1997**	**1998**	**1999**
Cash (in RM billion)	17.5	19.0	21.4	18.2	24.8
Cheques:					
Volume of cheques cleared (in million)	n.a.	96.1	104.8	133.2	154.1
Value of cheques cleared (in RM billion)	n.a.	1,109.9	1,304.7	954.1	1,041.9
Cards:					
No. of cards (in '000 units)					
of which: *Credit*	1,764.3	2,064.7	2,140.4	2,050.0	2,345.2
Debit	n.a.	n.a.	n.a.	n.a.	n.a.
Charge	233.7	250.1	246.2	221.7	213.0
Volume of transactions					
of which: *Credit*	n.a.	n.a.	n.a.	n.a.	n.a.
Debit	n.a.	n.a.	n.a.	350,523	320,129
Charge	n.a.	n.a.	n.a.	n.a.	n.a.
Value of Transactions (in RM billion)					
of which: *Credit*[13]	6.37	9.52	12.56	11.11	11.86
Debit	n.a.	n.a.	n.a.	0.02	0.02
Charge	1.60	1.90	1.92	1.54	1.74
Direct transfers:					
Volume of transactions (in million)	n.a.	n.a.	n.a.	n.a.	n.a.
of which: *Credit transfers*	n.a.	n.a.	n.a.	n.a.	n.a.
Direct debit	n.a.	n.a.	n.a.	n.a.	n.a.
Value of transactions (in RM billion)	n.a.	n.a.	n.a.	n.a.	n.a.
of which: *Credit transfers*	n.a.	n.a.	n.a.	n.a.	n.a.
Direct debit	n.a.	n.a.	n.a.	n.a.	n.a.

Source: Bank Negara Malaysia

[13] Credit card value includes the value of credit card purchases through SET Payment Gateway (i.e. Internet purchases).

Large Value Clearing	1995	1996	1997	1998	1999
Volume of transactions (in thousands)	n.a.	2,065.2	2,426.6	1,992.0	1,464.7
(i) SPEEDS:					
of which: *IFTS*	n.a.	2,029.3	2,390.4	1,947.3	-
SSTS	n.a.	35.9	36.2	44.7	-
(ii) RENTAS:					
of which: *IFTS*	-	-	-	-	1,408.3
SSTS	-	-	-	-	56.4
Value of transactions (in RM billion)	n.a.	15,977.7	23,421.3	18,078.5	12,414.0
(i) SPEEDS:					
of which: *IFTS*	n.a.	15,738.9	23,069.2	17,663.8	-
SSTS	n.a.	238.8	352.1	414.7	-
(ii) RENTAS:					
of which: *IFTS*	n.a.	-	-	-	12,166.0
SSTS	n.a.	-	-	-	248.0

Source: Bank Negara Malaysia

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Chapter 4

THE PAYMENT AND SETTLEMENT SYSTEMS IN MONGOLIA

by

Tsend-Ayush

1. Introduction

With the country's transition from a centrally planned economy to a market one in the early 1990s the then existing payment system underwent major changes. Households that had no bank balances prior to this time and new private businesses found themselves engaged with contracts and various obligations, both nationally and internationally, and had to make use of the payment and settlement systems.

As the private sector emerged, the Bank of Mongolia (BOM) gave up its commercial activities to newly established commercial banks. The country's banking industry switched to a two-tier system. In May 1992, the capital branch of the BOM was reorganised as an Inter-bank clearing and settlement centre for domestic currency payments and started accepting settlement balances from commercial banks.

Due to the vast land area and the nomadic lifestyle among the herders in the countryside, cash is still the main payment instrument in the country.

Presently, there are 12 banks in Mongolia classified as commercial banks. The BOM has licensed them with access to the Inter-bank clearing house (CH) being a direct member of the payment system. As previously mentioned it is difficult for the banks to keep track of the diverse settlement of the population in the country and only one bank i.e., the Agricultural Bank has successfully penetrated into the countryside.

The present CH operates in accordance with "The Inter-Bank Clearing Rules" of 1997 that is principally based on the Central Banking Act of 1996 and the Banking Act of 1996 and other related legal documents. The latest amendment made to the Rules was in March 2000 and became effective immediately.

2. Existing Payment and Settlement Systems

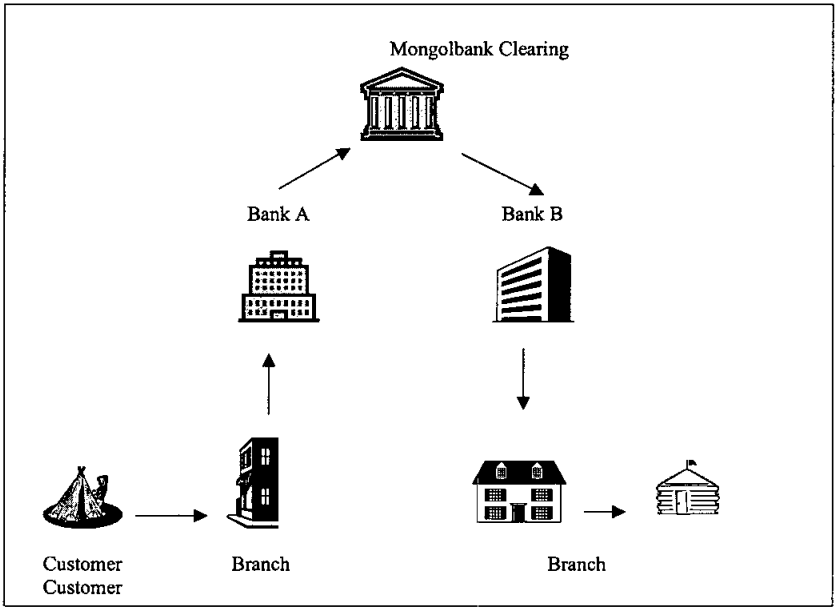
2.1 Domestic Payments

Domestically, transfers in both Mongolian togrogs and major reserve currencies can be made in Mongolia through the following systems.

- Inter-bank Clearing House (CH for MNT denominated transfers)
- FX Clearing

2.1.1 General Overview

The two systems are owned and operated by the Bank of Mongolia. Both are gross based settlement systems, the former clears payments electronically, the latter manually. However, the FX clearing system is discussed in more detail in the Section on "cross border payments".



2.1.2 Payment Methods

2.1.2.1 Cash Payments

Cash still remains the main instrument of payment in Mongolia. Besides the nomadic lifestyle among the people, the banking sector also suffered a crisis in mid 1990s with a number of failed banks. Ordinary people started to rely more heavily on cash. The Bank of Mongolia has since then carried out a restructuring policy and for the last two years, they have been signs that banks are regaining the public's confidence.

By law the Bank of Mongolia has the sole authority to emit banknotes and coins. As of 1999, notes issued are denominated in MNT 1, 3, 5, 10, 20, 50, 100, 500, 1000, 5000 and 10000, coins denominated in MNT 20, 50, 100 and 200.

2.1.2.2 Credit Transfers

Credit transfers are the most widely used cashless payment media in Mongolia. Normally a customer places his/her order with a bank in the bank's pre-formatted form. This would verify immediately against the balance of the account of the customers' concerned. If the remitting bank (branch) finds the cover sufficient, it is put manually into its own system for further transfer. In case the recipient holds no account anywhere the message should have a beneficiary ID no. or other details of equivalent importance.

The 1999 amendment to the Clearing Rules stipulates that the commercial banks have only one end access to the CH thereby stopping any inter-bank settlement in the countryside. It means the mode of payment between two different banks in the same aimag (province) has to clear through the two banks' headquarters in Ulaanbaatar and the CH.

Under normal conditions inter-bank transfers are completed on the same day in Ulaanbaatar, 1 to 3 days between aimag (province) branches.

2.1.2.3 Other Cashless Payments

Some commercial banks have started issuing other cashless instruments including cheques and different types of payment cards although volume of their transactions has been insignificant.

2.1.3 Structure, Operation and Administration

2.1.3.1 Mongolbank Clearing House(CH)

a. Participants

In addition to the Bank of Mongolia only 12 local banks and the Ministry of Finance have direct access to the system. Up to now the Bank of Mongolia has not set any admission criteria for the banks nor any specific number on the clearing members. The current situation thus enables any bank established in Mongolia and awarded with its licence from the Bank of Mongolia to apply for membership in the clearing system.

As of 1999 there were 13 direct members in the CH – 12 Commercial banks and The Bank of Mongolia.

b. Types of Transactions

The system clears both retail and large value credit transfers in Mongolian togrogs. Payments originated with other cashless instruments including cheques, various payment cards are not processed by the CH.

Apart from being a user of the system, the Bank of Mongolia also handles other transactions. Firstly, it includes transactions originated from the Bank's open market operations. Also as a separate entity, it deals with transactions of its internal operations such as salaries, pensions, bills and so forth, which require transfers through the system.

c. Operation of the System and Settlement Procedures

Although the system is often considered a gross system it is in fact a hybrid system having elements of both gross and multilateral net settlement.

Details are summarised in the table below.

The message flow is V shaped with the entire details of a message passing through the CH from the sending bank to the receiving bank. It can be accepted both in electronic and paper form depending on the customer's wish.

Stage	Description
Customer initiates payment	• Customers issue payment order; message from paying bank includes ordering customer name, ordering institution name, account with institution name, beneficiary details
Paying bank forwards messages to BOM	• Payment orders accumulated by paying bank and sent through to BOM 2-4 times • BOM processes twice a day (12.00 and 15.30)
Validation	• BOM checks each transaction for completeness and errors (each transaction should have date, paying, receiving parties references, and amount)
Acceptance for settlement	• BOM approves each transaction to be accepted for settlement • Each transaction passed to temporary account irrevocably • BOM sorts transaction by receiving bank; sends file to receiving bank with updated temporary account balance
Managing settlement funds	Insufficient balance on temporary account at end of day covered by bank with additional transaction with BOM e.g. cash replenishment, sell FX to BOM, discount BOM securities
Settlement	• Update current account with commercial bank's net position 17.00-18.00 • BOM delivers current account balance

d. Volume of Transactions

In 1999, 633,000 credit transfers worth MNT 594.55 billion were processed through the CH.

e. Pricing Policies

The standard fee of MNT 25 is charged to both the sending and receiving banks for each transaction. There is no CH admission or annual

fees. However, the rapidly increasing volume of transactions through the CH suggests that a review into the pricing policy is needed.

f. Management of Risks

The system is gross based and does not provide any liquidity support. This greatly reduces credit and liquidity risks and ultimately any systemic risk that could arise in relation to them.

Any operational risks are usually tackled by "the task distribution" among units at the Bank of Mongolia. The Bank is reviewing its safety measures for external factors such as fire, natural disasters or professional attacks.

2.2 Cross Border Payments

Most cross border transfers are executed through SWIFT that was first introduced in Mongolia in 1997. At present 5 banks are participating in the network.

2.2.1 General Overview

Cross border payments are carried out by banks through their correspondents abroad. For that usually banks have to be qualified and awarded with licence by the Bank of Mongolia. However, payments with both ordering party and beneficiary based in Mongolia, can be freely made between banks through their FX accounts at the Bank of Mongolia.

2.2.2 Payment Methods

2.2.2.1 Credit Transfers

This is the most popular instrument used. For transfers within the country, they are mainly originated as a result of FX trades between two commercial banks or a commercial bank and the Bank of Mongolia.

2.2.2.2 Other Methods

Foreign card and cheques are commonly used for cross border payments. Banks also settle various fees with their correspondents by direct debit or other prearranged instruments.

2.2.3 Structure, Operation and Administration

2.2.3.1 Foreign Exchange (FX) Clearing

a. Participants in the System

Banks and the Ministry of Finance and Economy can open current accounts in reserve currencies at the Bank of Mongolia to participate directly in the system.

b. Types of Transactions

The system only handles credit transfers between local banks.

c. Operation of the System and Settlement Procedures

Payment orders are manually forwarded by the participants. When verified correct, the transaction is approved and the transfer becomes completed.

d. Mongolian Togrog Versus Reserve Ccurrency Transactions

When the trade is between two commercial banks, the Mongolian togrog payment by the paying bank is processed by the CH in the same way as for other togrog transfers. The bank paying FX would in its turn initiate a paper payment order and it is settled against the bank's foreign currency current account.

When BOM is one of the parties to the trade, the commercial bank presents a FX purchase/sell order to BOM. In the case of a purchase, BOM credits the bank's FX current account and debits the togrog current account. The situation is reversed in the case of a sale.

e. Volume of Transactions

In 1999, nearly 5000 inter-bank transfers were recorded with the FX clearing.

f. Pricing Policy

The system currently clears all transfers within the country at no cost. Payments made by banks to their nostro accounts abroad are, however, subject to telecommunications fees.

3. The Implications of the Existing Payment and Settlement Systems for Financial Stability

Just as disorders in the financial market could ultimately affect the operation of the payment system, any disruption in the payment system would also affect the stability of the market. It is therefore necessary for both the authorities of the market and payment system overseers to work closely to monitor any instability in the sector.

3.1 Monetary Policy

3.1.1 Timely Information

The system provides the Monetary Policy and Research Department with a summary of information on a daily basis. However, when necessary it can produce information for a shorter period.

3.1.2 Effective Implementation of Monetary Policy (Bank's Annual Report 2000)

In the reporting period, the Bank of Mongolia implemented the State Monetary Policy Guidelines by prudent control of the money supply, containing inflation in order to ensure stability of the togrog, stabilising the financial sector, and deepening bank-restructuring measures.

The Bank of Mongolia put special emphasis on maintaining a positive Central Bank Bill rate in real terms to facilitate the conduct of unified interest rate policy in the direction of a gradual decline in the level of existing interest rates. Hence, the easing of the interest payment for the government made the introduction of government bills on the capital market possible. Also, with the decline in the level of the interest rates, loan-financing options for long-term manufacturing and investment may receive a fresh impetus.

3.1.2.1 Central Bank Bills (CBB)

By keeping the interest rate on the CBB positive in real terms and by carrying out a unified interest rate policy through the CBB rate, which is a prime rate in the economy, the Bank of Mongolia continued to influence the level of different interest rates within the economy in 2000. The Bank of Mongolia traded the CBB with 7, 14, 28, and 91-day maturities with the commercial banks.

The Bank of Mongolia controls the money supply, and in particular reserve money, by trading the CBB on the basis of the changes in the main determinants of the reserve money such as gold and foreign exchange purchases, or lending to the government. For instance, to sterilise an increase in the money supply due to the purchase of gold and foreign exchange in the second and third quarters of 2000, the Bank of Mongolia had to increase the outstanding volume of the CBB from around Togrog 20 billion to Togrog 30 billion. This demonstrates the possibility of responding quickly by using CBB trading to offset any undesirable developments in the reserve money.

During the year 2000, monthly average balances of the CBB were around Togrog 23.5 billion. The weighted average interest rate on the CBB at the end of 2000 was 8.6 percent per annum, which is 10.3 percentage points lower than the level for the end of 1999.

The declining CBB interest rate has the following positive impact on the economy:

1. The interest burden for servicing the existing bank restructuring bonds has declined, and created an opportunity for the Government to launch the market placements of short-term government bills to cover seasonal shortages in the budget revenues. As a result, the foundation of government bills as a new reliable market instrument has been laid out. In addition, the Bank of Mongolia has engaged for the first time in repo-type transactions by selling the government bills with a few commercial banks creating possibilities for fine-tuning with respect to bank reserves.
2. The decline of the CBB interest rate signalled the possible reduction of interest rates charged by the commercial banks, and in particular their lending rates. Although the non-performing loan ratio of the commercial banks was not reduced substantially, year-end levels of togrog

lending rates, foreign currency lending rates and deposit rates had already declined by 4.1, 10, and 6 percentage points respectively

3.1.2.2 Required Reserves

The Bank of Mongolia puts a control over the daily fulfilment of the required reserves of the commercial banks in order to control the money supply through controlling the reserve money.

As a result of the activities to strengthen the financial positions of the commercial banks, the mandatory reserves requirement established by the Bank of Mongolia during 2000 was fulfilled. This situation demonstrates, on one hand, the possibility of influencing money supply through the reserve requirements, and, on the other hand, the ability of the commercial banks to meet customers demand for withdrawal, which was not always the case in the past.

In the reporting period, depending on the monetary situation and growth of the excess reserves of the commercial banks, the existing 14 percent level of the required reserves was observed and will remain in effect. As partial compensation for holding reserves with the central bank, Togrog 0.5 billion in interest was paid to the commercial banks.

In fact, during 2000, the commercial banks prefer to place excess reserves amounting to Togrog 4.1-11.3 billion in their current accounts with the Bank of Mongolia instead of lending to reduce their exposure to risk factors. As a policy response, the Bank of Mongolia reduced the level of remuneration it paid to the banks on their reserves at the end of 2000 and intent to completely abolish the remuneration system by the first half of 2001. In 2001, the Bank of Mongolia will focus its efforts on more efficient investment of excess reserves of the commercial banks by encouraging banks to channel the credit funds towards export and employment generation.

The Bank of Mongolia has imposed total monthly credit ceilings on certain commercial banks, which were unable to meet the prudential ratio requirements for the commercial banks. This included the Savings Bank (with a ceiling until October, 2000) and Agricultural Bank (ceiling imposed November, 2000). It is worth mentioning that imposing the total credit ceilings had been an effective administrative tool to contain unhealthy growth in lending in the early or mid 1990's. It still proves to be helpful in con-

trolling the expansion of certain commercial banks currently affected by the bank restructuring measures and those, which cannot currently meet all prudential ratios requirements.

3.2 Payment System Oversight

Generally, a central bank is concerned with the soundness of the payment system for several good reasons. It is responsible for stability in the economy that is directly related to conditions of the payment system. As we may be aware, the Bank's monetary policy is channelled through the payment system. The Central Bank is also concerned about the efficiency of the payment system and the reliability of instruments being used by the public, that is public confidence in the national currency. These are primary objectives of the Central Bank and in order to achieve them, it oversees closely the payment and settlement systems. This includes designing an efficient payment system and management through standards, regulations and maintaining them and also to manage and avoid potential risks, which will upset the payment system and market as a whole.

The monitoring role of the Bank of Mongolia in the payment system is recognised in law. Article 5 (5) of the Central Banking Act states "the fundamental tasks to be carried out by the Bank of Mongolia shall be [...] to promote smooth operation of the payment system." Further, Article 20 of the Act states that the Bank of Mongolia may provide such facility (payment system) and may make regulations to ensure efficiency and soundness in the payment system.

It reserves the right to have an operational role and to issue regulations for the payment system.

3.3 Competition/Innovation

3.3.1 Participant Requirements

A commercial banking institution may become a participant in the CH as follows:

- If it functions from an office located in Mongolia
- The office in Mongolia is subject to regulation by the Bank of Mongolia

- It transmits payment messages to and receives payment messages from the CH only through a connection that meets the requirements of "The Inter-bank Clearing Rules"

To date, no foreign bank has been registered to operate in Mongolia. However, in principle if the above requirements are met, the foreign bank offices could apply for membership in the CH and become a member.

4. Consumer Protection

By law, the consumer is entitled to defect-free, full services for fair prices. Also the consumer as a member of society has his or her own privacy protected by law.

In the case of the payment systems, the consumer should be protected from errors, malfunctions and dishonour. The payment systems in Mongolia reflect the provision in its activities and rejects disclosure of payment message details.

Human related errors are usually tackled through verification of transactions. Daily transactions are backed up and stored on a separate machine. Payment messages and their details are encrypted from participant to participant.

5. Recent Payment System Developments and Policy Initiatives

Recently, message traffic has been increasing (up 349 per cent in 2000) and banks are waiting until later in the day to forward their transactions. This represents the issue of peak hour processing and suggests upgrade in hardware resources.

Alternatively, the Bank of Mongolia is looking into 'time of day' pricing whereby the fee charged to the bank requesting the service would be higher (a premium to the standard fee) in the afternoon (between 1330 and 1500 hours) than the rest of the day.

Country Table

Table 1. Major event affecting the payment and settlement systems

Date	Major Development
May 1992	Setting up of Inter-bank Clearing House (MCH)
March 1996	Electronic Funds Transfer at MCH
March 1996	Adoption of Inter-bank Clearing Rules

Table 2. Selected Country Indicators

	1995	1996	1997	1998	1999
Population (millions):					
Year end	2.2	2.3	2.3	2.3	2.4
GDP (MNT billions)	550.25	646.56	832.64	817.39	925.35
GDP per capita	239,877	277,505	352,319	341,106	388,393
Exchange Rate (against USD)					
Year end	473.60	693.50	813.20	902.00	1,072.40
Average	446.90	547.20	790.95	837.36	1,022.60

Table 3. Settlement media used by non-banks (at year end)

	1995	1996	1997	1998	1999
Notes and coin (MNT billions)	25.59	41.70	49.77	56.45	87.28
Transferable deposits (MNT billions)	17.05	22.60	26.34	26.14	27.54
Narrow money supply (M1) (MNT billions)	42.64	64.30	76.11	82.59	114.82
Memorandum item: (MNT billions) Broad money supply (M2/M3)	102.04	128.40	170.07	167.25	220.17

Table 4. Settlement media used by banks

	1995	1996	1997	1998	1999
Reserve balances held at central bank	7.77	5.11	6.20	13.02	20.51
Of which:					
Required reserves (MNT billions)	7.14	6.41	4.86	7.04	9.45
Free reserves					
Transferable deposits (MNT billions)	17.05	22.60	26.34	26.14	27.54
Memorandum item: (MNT billions) Institution borrowing from central bank	7.40	10.89	0.76	4.46	2.07

Table 5. Institutional Framework (1999)

Categories	Number of institutions	Number of branches	Number of accounts	Value of accounts (MNT Billions)
Central Bank	1	20		
Commercial:				
Public	4	361	473,338	83,100.50
Private	8	99	15,246	42,124.40
Foreign				
Development and investment banks:				
Public				
Private				
Foreign				
Special Finance houses	1	7		
Money Exchangers				
Post Office				

Table 6. Cash dispensers, ATMs and EFTPOS terminals

	1995	1996	1997	1998	1999
Cash dispensers and ATMs:					
Number of networks (year-end)					
Number of Machines (year-end)					
Volume of transactions (during)					
Value of transactions (during)					
EFTPOS:					
Number of networks (year-end)					
Number of Machines (yea-end)					
Volume of transactions (during)					
Value of transactions (during)					

Table 7. Number of payment cards in circulation (at year-end, in thousands)[1]

	1995	1996	1997	1998	1999
Cards with a cash function					
Cards with a debit/credit function[2]					
Of which					
Cards with debit function					
Cards with credit function					
Cards with a cheque guarantee function					
Memorandum item:					
Retailer cards					

Table 8. Payment instructions handled by selected payment systems: volume of transactions

	1995	1996	1997	1998	1999
Mongolian Inter-bank Clearing System					
Credit transfer	351,100	523,300	1,034,000	739,000	658,500

Table 9. Payment instructions handled by selected payment systems: value of transactions

	1995	1996	1997	1998	1999
Mongolian Inter-bank Clearing System					
Credit transfer (MNT billions)	n.a	495.59	1,803.80	742.49	594.55

Table 10. Indicator of use of various cashless payment instruments: volume of transactions

	1995	1996	1997	1998	1999
Cheques issued					
Payments by cards *Credit cards* *Debit cards*					
Paperless credit transfers					
Postal money orders					
Postal cheques					

Table 11. Indicator of use of various cashless payment instruments: value of transactions

	1995	1996	1997	1998	1999
Cheques issued					
Payments by cards *Credit cards* *Debit cards*					
Paperless credit transfers					
Postal money orders					
Postal cheques					

Table 12. Transfer instructions handled by securities settlement systems: volume of transactions

	1995	1996	1997	1998	1999
No. of auctions	24	24	27	30	43
Bank of Mongolia bills					

Table 13. Transfer instructions handled by securities settlement systems: value of transactions

	1995	1996	1997	1998	1999
Outstanding amount Year end (MNT billions)	1.33	1.40	19.06	11.70	21.20
Bank of Mongolia bills					

Chapter 5

THE PAYMENT AND SETTLEMENT SYSTEMS IN MYANMAR

by

Khin Thida Maw

1. Introduction

Around 1800, during the reign of Myanmar Kings, there was only a small demand for money, credit and banking facilities. With the exception of Tanintharyi and Rakhine where coins had been used even before 1800, the economy was on a cash basis using gold and silver bullions as a payment media instead of coins.

After the annexation of Lower Myanmar in 1852, the British introduced Indian coinage as standard currency in lower Myanmar. Opening a branch of the Presidency Bank of Bengal at Yangon (formerly known as Rangoon) in 1861 was the earliest provision of commercial banking facilities in Myanmar. In 1921, the three Presidency Banks of Bengal, Bombay and Madras were amalgamated to form the Imperial Bank of India, which performed commercial banking as well as central banking to a limited extent in accordance with the Imperial Bank of India Act of 1920. Until 1935, when it handed its central banking functions over to the Reserve Bank of India, it used to act as the clearing bank for the clearing house situated at the Imperial Bank (Yangon). At that time, and even under the aegis of the Reserve Bank of India there had always been only one clearing a day - at about 12 noon. Most banks were members of the clearing though a few cleared through other member banks.

After the Second World War, the Reserve Bank of India stopped functioning in Burma on 31 March 1947, and some of its functions were carried out by the Treasury and the right of currency issue was transferred to the Burma Currency Board. The Burmese Rupee continued to be linked to the India rupee by the free exchange of one currency for the other through the Reserve Bank of India. During the post-war years until 30 June 1952, the country was on the sterling exchange standard at a fixed exchange rate of one rupee to I shilling 6 pence, with a rigid and fully utilised fiduciary issue of Rs. 100 million.

The legislations affecting central banking post-war Myanmar were:

(1) The Union Bank of Burma Act, 1947, with minor amendments made in April and October 1948, and
(2) The Union Bank of Burma Act, 1952.

The Act of 1947 created the Union Bank with limited functions of a Central Bank and the 1952 Act empowered the standard authorities of a Central Bank. Since the establishment of the Union Bank of Burma, the Bank introduced the Myanmar Currency Kyat and the decimal system, and acted as a clearing house for the cheques issued by 16 listed commercial banks. The Union Bank was reorganised under the centrally planned economy as a monolithic bank namely the People's Bank of the Union of Burma.

In 1976, for more effective management of financial activities, the monolithic banking system was dismantled and the Union of Burma Bank performed the central banking functions. Following the adoption of market-oriented economy in September 1988, the new banking Laws, namely; the Central Bank of Myanmar Law, the Financial Institutions of Myanmar Law and the Myanma Agriculture and Rural Development Bank Law were enacted in 1990 to promote and enhance the efficiency of financial activities.

In accordance with these new banking laws, the establishment of private financial institutions such as commercial banks' investment or development banks' finance companies and credit societies etc, were allowed for the first time since 1969. The present structure of financial institutions that provide payment and settlement services consist of a Central Bank, a number of commercial banks, which are State-owned as well as privately owned, and a number of foreign banks' representative offices. As a banker to the banks, the Central Bank of Myanmar provides payment services to commercial banks and as the sole issuer of domestic currency, issues banks notes and coins. Under the Chapter ID, Article 57 to 74 of the Central Bank of Myanmar Law 1990, the Central Bank's relations with financial institutions are prescribed. Under the Article 74, the authority to make arrangements for the clearing of cheques and other instruments used as means of payments is empowered. The Central Bank, four State-owned commercial banks and twenty domestic private banks provide payment services that directly relate to deposit, loan and associated account services, to their customers.

The structure of Myanmar's payment system can be described as so called hierarchy (inverted pyramid), which consists of three major levels of participants—broad base of economic actors' commercial banks and the central bank. All of the banking institutions, especially private banks are introducing new types of banking facilities with diverse products, after receiving approvals from the Central Bank of Myanmar. Cash, cheques, payment orders, direct debit transfers and payment cards are generally used for small-value payment system. Cheques and payment orders are common use of large value transfer system, which is provided by the Central Bank.

2. Existing Payment and Settlement Systems

2.1 Domestic Payments

2.1.1 General Overview

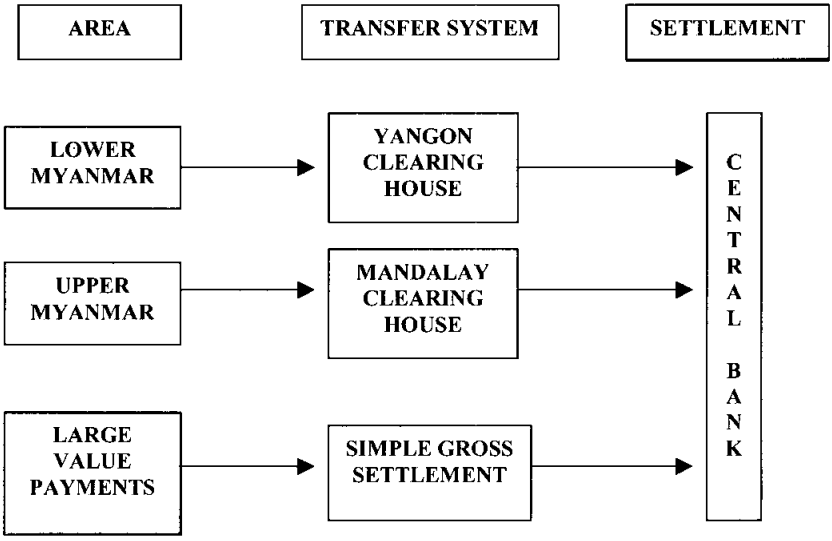
After the stipulation of the new banking laws in 1990, the Myanmar banking system was reactivated with private sector participation. "The present structure of Myanmar banking institutions consists of a central bank, four State-owned banks, twenty domestic private banks and twenty-eight foreign banks representative offices. With a view to laying down the ground work for the smooth payment transactions of market oriented economic system, all banking institutions are endeavouring their best efforts to provide the payment and settlement system effectively and efficiently. (The present structure and the list of Myanmar banking institutions are shown in Annexure land 2, respectively.)

The structure of Myanmar's payment system consists of major three levels of participants in payment mechanism. At the top of the inverted pyramid is the broad base of economic actors who use the payment instruments for their daily activities. At the second, commercial banks, which hold accounts with the Central Bank of Myanmar and at the third, the Central Bank of Myanmar, which holds accounts for virtually every commercial banking institution and serves as the ultimate settlement authority. Taking advantage of being the issuer of settlement money, the Central Bank of Myanmar provides large value transfer services.

Acting as an apex of the banking industry, the Central Bank of Myanmar ensures the efficient provision of clearing and settlement services with its two clearing houses located in Yangon, which is for lower Myanmar and Mandalay, which is for upper Myanmar. Commercial banks provide pay-

ment services by introducing new types of banking facilities with diverse products as well as by extending the network of banking system throughout the country for wider use of banking services of the people living in rural and remote areas. All of the banking institutions, especially private banks, are introducing new types of banking facilities, after receiving approvals from the Central Bank of Myanmar. Cheques and payment orders are common use of large value payment system. Cash, cheques, payment orders, direct debit payments and payment cards are generally used for small-value payment system. Automatic Teller Machines (ATMs) and Point of Sales (POS) Terminals are also installed for the convenient use of the payment system.

Chart I
Organisation of
the Myanmar Interbank Payment and Settlement Systems



There are also two agreements signed by the private banks for their interbank transfers within their own groups of those signed banks. The first agreement was signed by a group of five private banks 1998 and the second was recently signed by another group of three private banks. Participants of a group must have accounts with each other for the settlement of these payments. Simple gross settlement system is used between each pair of banks for this of interbank transfer.

2.1.2 Payment Methods

2.1.2.1 Cash Payments

Though Myanmar banking sector has been reactivated with private sector participation since 1992, the economy still dominantly uses cash for daily economics activities. Table 1 shows the ratio of settlement media used by non-bank, to broad money supply (M2). As the banking system becomes more reliable, the ratio of cash to broad money supply exhibited downward trend while that of transferable deposit indicated upward trend.

Table 1: Settlement media used by non-banks (% of Broad Money Supply)

	1995	1996	1997	1998	1999	2000
Notes and coins	64.2	61.9	61.9	56.6	50.5	45.3
Transferable deposits	6.8	6.0	7.7	10.1	12.6	14.6
Narrow money supply (M1)	71.0	67.9	69.6	66.7	63.1	59.9
Broad money supply (M2)	100.0	100.0	100.0	100	100.0	100.0

2.1.2.2 Non-Cash Payment

Non-cash payment instruments can be generally classified as follows:

a) Cheques
b) Payment Orders or Credit Transfer
c) Direct Debit Payments
d) Payment Cards (i.e. credit cards and debit cards for ATM and POS)

Since commercial banking services, at the earliest stages of colonial period, were provided by foreign banks with the main purpose of supporting trade, Myanmar people are accustomed to the use of cheque. Cheques are mostly used in payments of government institutions as well as private sector business transactions. Cheques used in Myanmar are classified as bearer cheque, order cheques and gifts cheques.

Payment orders on credit transfers are made for the purpose of placing funds at the disposal of a beneficiary. This payment method is used for the interbank fund transfers as well as individual payments for utility

bills. An account holder gives his/her bank instructions to initiate credit transfers to the payee.

Direct debit payment is mainly used for hire purchase agreements and transactions to current account from call deposit account of the same customer. Almost every account of transferable deposit is linked with call account of the same customer since call account is paid interest for 24 hours deposits whereas no interest is paid on current account. Therefore, business entrepreneurs who use cheques for everyday business transactions normally link the current account with their call account. When the cheque is not covered with the amount at the current account, the bank will transfer money from the call account to current account at the price of fifteen kyats for each transaction.

Payment cards are generally classified as debit cards (cards with cash function for ATMs, cards for POS and smart cards) and credit cards. Cards for the Automatic Teller Machines are used to withdraw cash from the card holders' account. Some banks provide cards than can be used in Point of Sales (POS) terminals at merchant establishments. Smart cards can be used as cash card, account cards and smart credit card so that these cards have both debit and credit functions. Debit cards enable the holder to make purchase and to charge those purchases directly to a current account at the bank issuing the card. Credit cards provide the holder a line of credit enabling him or her to make purchases and/or to draw cash up to a prearranged amount. All payment cards are magnetic strip cards.

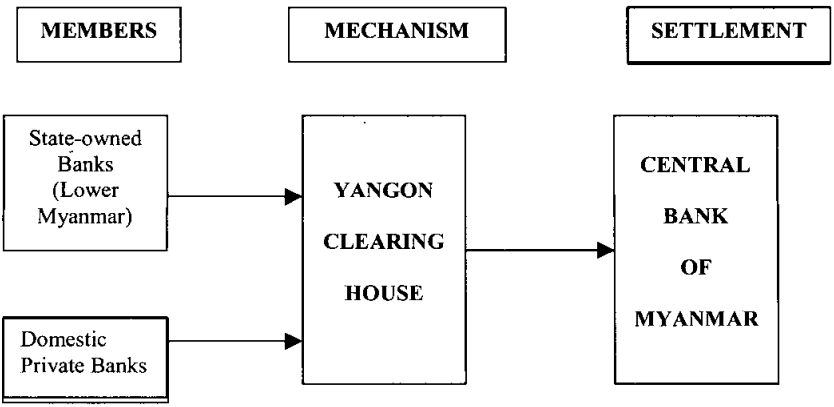
Payment cards of domestic private banks are issued individually as a property of the issuing bank by using their own settlement arrangement. A bank is responsible for the settlement of its own issued payment cards. No settlement organisation is formed for the settlement of payment cards.

2.1.3 Structure, Operation and Administration

As presented above, there are two clearing houses in Myanmar. The responsibilities of clearing houses are defined in term of areas, in term of payment instruments. Both are responsible for the clearing of cheques and other paper-based instruments used as means of payments. One is located at the headquarters of the Central Bank of Myanmar in Yangon, mainly responsible for lower Myanmar and another one is located at the branch of the Central Bank of Myanmar in Mandalay, mainly responsible for upper Myanmar.

There are fifty-seven members in the Yangon Clearing House: there are the Head Office and branches of the Myanma Economic Bank located in Yangon area, the Myanma Foreign Trade Bank, Head Office of the Myanma Investment and Commercial Bank, the Myanmar Agriculture Development Bank and Head Office and some branches of the twenty domestic private banks. The branches of the Myanma Economic Bank and private banks, the member of Yangon Clearing House, located both in and outside of Yangon in Lower Myanmar claim through one of the member banks. In general, branches of Myanma Economic Bank perform as correspondent banks for indirect participants.

Chart 2
YANGON CLEARING HOUSE



The Mandalay Clearing House, which has similar structure of clearing system as the Yangon Clearing House, processes cheques and other paper-based payment instruments for Upper Myanmar. Branches of the Myanmar Economic Bank, some of which are acting as the correspondent banks of other non-member branches of the Myanma Economic Bank, Mandalay branch of the Myanma Investment and Commercial Bank and branches of domestic private banks are members of the Mandalay Clearing House, which now has a total of twenty-two members.

Regardless of where the clearing house is located, all paper-based payment is finally settled in the books of the Central Bank of Myanmar.

The Yangon clearing house is administered by the Chief Accountant of the Central Bank of Myanmar whereas the Mandalay clearing house is administered by the Mandalay branch of the Central Bank of Myanmar. The registration and withdrawal of membership to/from the clearing have to be made fourteen days in advance. There are no fees levied for the membership and clearing and settlement. The operations are carried out manually. Payment instructions are required to be presented to the clearing house physically. Only one meeting is arranged at 1:30 p.m. in each business day except the closing date of a fiscal year, when it holds two meetings. The banks present cheques received from their customers to the drawee banks. After receiving the cheque, the net obligation of each bank is determined.

After the clearing operation, the banks' representatives return to their banks to obtain payment authorisations and collect any cheques that are to be returned in the next meeting. Debtor banks have to settle their outstanding debit position by settlement advice from their deposits at the central bank on the following business day. If bank's obligation is not covered by its account with the central bank, it could be provided by the central bank either by rediscounting securities or extending 92 days loan against with collateral presented. However, the overdrafts are not allowed. Once all the banks have paid their obligations, the central bank makes payments to creditor banks.

Though the Central Bank of Myanmar Law empowers the Central Bank to prescribe the minimum and maximum commissions, service charges and other fees, which are levied on any type of transactions provided by the financial institutions to the public or to other financial institutions, the Central Bank of Myanmar does not practically use the authority of pricing policies to bind the service charges in order to enhance competition among banks. However, this authority will be used when the banks' pricing policies are in contrast with the financial system's policies. Therefore, at present the pricing policy of individual bank is made on its own decision, which is normally based on competition in the banking market.

For the central bank's services for large value fund transfer within Yangon area, no fee is charged, and for the outside area of Yangon, a fixed services fee of .02 percent is charged to the sending participant. Private banks charge the fees based on type and amount of transactions. Average fee for interbank fund transfers is .025 percent.

The bank participants in the clearing have to deal with any crisis themselves caused by the failure of one of the members of the system to settle. The Central Bank of Myanmar does not absorb losses and guarantee settlement. The member banks have agreed to unwind the settlement as a contingency arrangement to deal with a settlement failure. Therefore, all of the underlying payments involving a participant that is unable to meet its settlement obligation will be deleted from the netting, and the settlement positions of the remaining participants will be recalculated. In general, the banks would make adequate provisions to meet the highest possible obligations arising from their own activities and any contingent obligations they would be required to assume if another bank fails. So far, they have been no serious settlement failure in the clearing system.

2.1 Cross Border Payments

2.2.1 General Overview

At present, only State-owned banks are permitted to provide foreign exchange banking services in Myanmar. Therefore, the payment service providers in the cross-border payment services are the Myanma Foreign Trade Bank, the Myanma Economic Bank and the Myanma Investment and Commercial Bank for the public and private sectors and the Central Bank of Myanmar for the government. At present, there are twenty-eight representative offices of foreign banks, which are undertaking data collection and some of which are servicing as authorised agent bank of some worldwide credit cards.

The currency of Myanmar, the kyat, is not convertible and pegged to the Special Drawing Rights (SDRs) at kyat 8.50847 per SDR. Therefore, cross-border payments are made in other foreign currencies. Along the border area, payments are made in other foreign currencies and the currencies of neighbouring countries.

Retail payments are made not only via banks, but also via worldwide credit cards and traveler's cheque companies'/banks' representative offices. Credit card payments and traveler's cheque are settled through their representative offices in Yangon.

2.2.2 Payment Media

2.2.2.1 Cash

The Myanmar currency, the kyat, is not convertible so that cross border payments are made in other foreign currencies. Since Myanmar is a member of the Asian Clearing Union (ACU), it is also uses the ACU dollar as a mean of cross border payments in accordance with the ACU clearing and settlement system.

2.2.2.2 Non-cash

In addition to the foreign currencies, the ACU dollar, which is equivalent to US dollar, is used as a mean of payments for the international payments among the ACU member countries-Iran, Sri Lanka, India, Pakistan, Nepal, Bangladesh, Myanmar and Bhutan.

As other commercial banks engage in international banking, the State-owned domestic banks provide banking service relating to letters of credit, remittances and issuing bank drafts, and issuing, accepting, discounting, buying, selling and collecting all securities including bills of exchange.

Credit cards authorised to use for payments in foreign exchange are American Express, Visa, Diner and JCB (Japan Credit Card). Authorised travelers' cheques are American Express, Visa, Master and City Corp.

The Central Bank of Myanmar has issued Foreign Exchange Certificates (FECs) in denominations of 1,5,10 and 20 units being equivalent to US dollars 1,5,10 and 20 respectively, since February 1993 for the convenience use of tourists in particular and foreign currency account holders in general. FECs are exchangeable with six hard currencies or acceptable traveler's cheques. FECs are used alike for various type of payments made by both residents and non-residents within Myanmar.

2.2.3 Structure, Operation and Administration

Foreign exchange control is administered by the Controller of Foreign Exchange of the Central Bank of Myanmar in accordance with instructions from the Ministry of Finance and Revenue. All payments for invisible transactions outside the public sector are subject to approval and are consid-

ered on a case-to-case basis. Prior approval from Controller of Foreign Exchange is needed for remittances of insurance premium.

Banks use their correspondent banks where they have nostro account for making cross border payments. Domestic banks send messages to their vostro banks using tested telex for their international payments and transactions. Fund transfers made in US dollars are settled through the New York Clearing House. Fee charged for fund transfers depend on the receiving country and the value of the transfer.

As a member of the Asian Clearing Union, settlements with member countries are made in ACU dollar through the ACU mechanism. The Chief Accountant of the Central Bank of Myanmar serves as the administrator of the ACU account in Myanmar. The Myanma Foreign Trade Bank and the Myanma Investment and Commercial Bank have been designated by the Central Bank of Myanmar for the purpose of payments to be made through the ACU clearing facility. The use of the clearing facility is optional. All instruments of payment are denominated in US dollar or other convertible currencies. All transactions among member countries are accounted for in US dollar and the involvement of the central bank is limited to the receipt or repatriation of surplus funds in nostro accounts and replenishment of balances in that account. The accounts of the ACU are kept in a common unit of account designated as the ACU dollar.

Deferred multilateral net settlement system is used to calculated net claim or obligation of each bank with clearing union. Settlement of the balances and accrued interests are made at the end of each two monthly periods. In other words, accrued interest is included in the calculation of the net amounts to be paid or received. Interest is paid by net debtors and transferred to net creditors on daily outstanding balances during interval period of two consecutive settlement dates. The rate of interest is determined by the Board of Directors, subject to change from time to time on the basis of the rate in major financial centres. Each participant is notified of its net position at the end of each settlement period and debtors make the payments within four business days of the notice in international reserve assets. In the event of balance of a debtor remains unpaid after fifteen days from the date it was due, the participant is deemed to have defaulted.

3. The Implications of the Existing Payment and Settlement Systems for Financial Stability.

3.1 Monetary Policy

3.1.1 Timely Information

The Accounts Department of the Central Bank of Myanmar submits the daily position of clearing operation and related information such as banks' balance at the central bank, the net obligation of each bank, the total outstanding of debit/credit positions to the central bank and government treasury bonds held by the each member bank, which is normally used as collateral for the central bank lending, etc. to the monetary authorities concerned. The daily position of large value interbank fund transfers through the central bank is also presented.

Moreover, weekly, monthly position of cheque and other payment instruments cleared in both clearing houses are compiled. Though the clearing houses are manually operated, the data compilation and processing in the Accounts Department are computerised.

3.1.2 Effective Conduct/Implementation of Monetary Policy

The objective of the monetary policy of Myanmar are to ensure adequate expansion of money supply appropriate to support a growing economy at reasonable stable prices and to promote domestic resource mobilisation. Therefore, the Central Bank of Myanmar has been performing its functions of acting as the sole issuer of domestic currency and as a banker for the banks; and inspecting and supervising the financial institutions in order to achieve its objectives of promoting efficient payments mechanism and the liquidity, solvency and proper functioning of a soundly based financial system conduct to sustained economic development.

At present, the Central Bank of Myanmar implements monetary policy through effective use of reserve requirements, interest rate and to a certain extent, open market operations as monetary instruments. Banks are required to hold reserves of 5 percent and 10 percent on time and demand deposits respectively, in aggregated accounts that cannot be used for payment.

To ensure a safe and sound banking system, the monetary authorities look at the daily, weekly and monthly information of interbank fund trans-

fer coupled with prudential financial ratios of the banks and identify the significant large value payments, which could effect the liquidity position in the banking system and the effective use of monetary policy instruments. Since Myanmar does not have a developed money market yet, the intra-day movement of fund transfers is not seriously worrisome. Therefore, the information produced by the existing domestic payment and settlement systems has been, to a certain extent, still appropriate in the conduct of monetary policy to date.

3.2 Payment System Oversight

The Central Bank of Myanmar recently established a new department; namely the Banking Regulation Department, to review all existing bank regulations and when it is necessary, to issue new regulations including payment and settlement system regulations. To date, there are no specific payment and settlement systems regulations and no national payment council. The Myanmar Banks Association, which is chaired by the Governor of the Central Bank of Myanmar, was formed on April 1, 1999. All banks are members of the Association. It holds meeting once a month to discuss banking sector issues and to closely coordinate the banking system. When the issues discussed at the meetings need to be undertaken, all member banks participate to cooperate and coordinate in undertaking these issues.

Box 1. Prudential Regulations for the Banking Sector

The elements of the prudential and supervisory regulations and oversight are:

- A reserve requirement of 5 percent and 10 percent on time and demand deposits, respectively, including foreign currency denominated deposits. At least 75 percent of reserves must be held as a nonremunerated deposit at the central bank and the rest in cash. Holdings of Treasury bonds can be counted against the reserve requirement.

- A penalty of 0.2 percent per day is levied on the shortfall in the prescribed reserves.

- A liquidity ratio of 20 percent is required so that banks can meet demands for liquidity in a cash dominated economy.

- A 10 percent risk weighted capital adequacy ratio.

- A general provision of 2 percent of outstanding loans, and loan loss provisions of 50 percent and 100 percent of the stock of doubtful and bad loans, respectively.

- A lending limit to a single client is 20 percent of banks' capital and reserve.

- An annual on-sight inspection by the Central Bank of Myanmar.

- The following reports must be submitted to the Central bank of Myanmar:

  Required reserves and liquidity ratio (weekly); asset and liabilities statement (monthly); income and expenditure statement (monthly); capital adequacy ratio (monthly); general ledger (monthly); non-performing loans (quarterly); distribution of loans and advances by sector and security (quarterly); provisions of bad and doubtful debts (annually); and profit and loss (annually)

3.3 Competition/Innovation

As presented in section 1, after the stipulation of the new banking laws in 1990, the Central Bank of Myanmar has granted licenses to open domestic private banks since May 1992. At the end-May 2001, 20 domestic private banks are in operation providing commercial banking services with computerised system and expanding their branches in major cities as well as in remote area, the total of which has come up to 217. The Central Bank of Myanmar, as an overseer of the payment systems, has encouraged the private banks to introduce new banking facilities such as issuance of payment instruments and systems, provisions of interbank remittance and trade guarantees, trust services, leasing, hire purchase, etc. upon the application of the private banks and based on their financial soundness. On the other hand, state-owned banks provide nationwide commercial and development banking services with over 550 branches throughout the country, of which some are computerised. Since the private sector has more financial and technical resources and entrepreneurial incentives, the role and the market share of private banks compared to State-owned banks has increased significantly in recent years. At the end of December 2000, private banks held 71.0 percent of deposits and extended 66.8 percent of credit to the private sector. (The financial positions of domestic private banks and date of commencement are shown in Annexure 3.)

4. Consumer Protection

4.1 Payment Systems

As described in Box 1, the Internal Audit and Bank Supervision Department is undertaking offsite and on-site inspection of all banking institutions to conform sound financial operating principles, whereas the banks are providing payment services on competition basis in the banking industry, which incurs the break even price of transaction costs determined by the market. No limitation is found for the determination of transaction costs.

4.2 Payment Services Provider

As presented in section 2.1.2, banks are required to hold reserves in segregated accounts that cannot be used for payments. Such arrangement is imposed as a prudential measure to ensure that funds will be available in all circumstances to meet customer withdrawals.

Since Myanmar telecommunication infrastructure is not yet functioning well for the banking system, all instructions, transactions and processing are recorded manually on paper. Therefore, if a payment card system faces malfunction, the records on paper are backup files for the payment transactions.

5. Recent Payment and Settlement Systems Developments and Policy Initiatives

It is clear that private sector participation in the banking industry has contributed to significant development of payment and settlement systems. Private banks introduced new banking services such as hire purchase, leasing, trust, auto pay and safe deposit lockers, as well as payment instruments such as traveler cheques, gift cheques, credit cards, debit cards, smart cards, cards for ATM machines and cards for POS terminals. Card issuing banks set up their own arrangement for usage of issued cards. Recently, on-line credit card system has been introduced. However, there is no electronic fund transfer and electronic money in the Myanmar banking system. Nevertheless, the payment and settlement systems have become faster, more reliable and more predictable since private sector joined the provision of payment services.

The Central Bank of Myanmar has taken stringent measures for the banks to conform to prudential regulations in order to ensure financial system stability coupled with the development of payment systems. A comprehensive system of reporting is in place for verifying the banks' compliance with reserve, minimum liquidity, capital adequacy and loan provisioning requirements.

As presented in the previous sections, the new banking laws were enacted in July 1990. Rules and Regulations relating to the said laws were issued in April 1991 and May 1992 respectively. The law amending the Central Bank of Myanmar Law and the Law amending the Myanma Agriculture and Rural Development Bank Law were enacted in January 1997. On February 1, 2001, a new department, namely the Banking Regulation Department, was established to review all existing banking regulations when it is necessary, to issue new regulations including payment and settlement systems regulations.

Moreover, the Myanmar Bank Association also supports the development of payment and settlement systems in Myanmar. The objectives of the

Association are to cooperate and coordinate among banks, banking sector issues ensuring supportive role of banking sector in the State for the development of the entire economy; to support the policy guidelines laid down by the State for development of agriculture, industrial and trade sectors; and to nurture the public habit of relying on banks. Monthly meetings of the Association support better understanding among the bankers and banks' activities. Therefore, private banks could see the opportunity to getting greater market share by introducing the new types of payment instruments as well as banking services to their clients.

6. Suggestions and Recommendation on the Role of Central Bank in Ensuring the Safety and Efficiency of the Payment Systems

Since the payment system overwhelmingly affects a large number of economic actors and business activities, its soundness, integrity and security is of vital concern to the central bank, as a guardian of public interest[1]. The precise role of the central bank will vary from country to country and will depend on the relationship of the central bank to other public sector agencies and the private sector, and on the extent of its own participation in the payment systems. Its role in leading the development of the payment system arises from its intimate knowledge of payment systems issues gained through its own activities, notably providing a range of financial services to government, managing liquidity conditions, and carrying out its oversight of clearing systems.[2]

As clearly defined in Chapter II, Article 6 of the Central Bank of Myanmar Law 1990, the objective of the Central Bank of Myanmar are as follows:

(a) to promote efficient payments mechanisms, and the liquidity, solvency, and proper functioning of a soundly based financial systems;
(b) to foster monetary, credit and financial conditions and conducive to the orderly, balanced, and a sustained economic development.

Moreover, Article 7 adds the conferring of power to the Central Bank of Myanmar that "in endeavouring for the successful achievement of its objectives in accordance with its aim, the Central Bank shall have, and may exercise all the powers generally conferred upon a central bank".

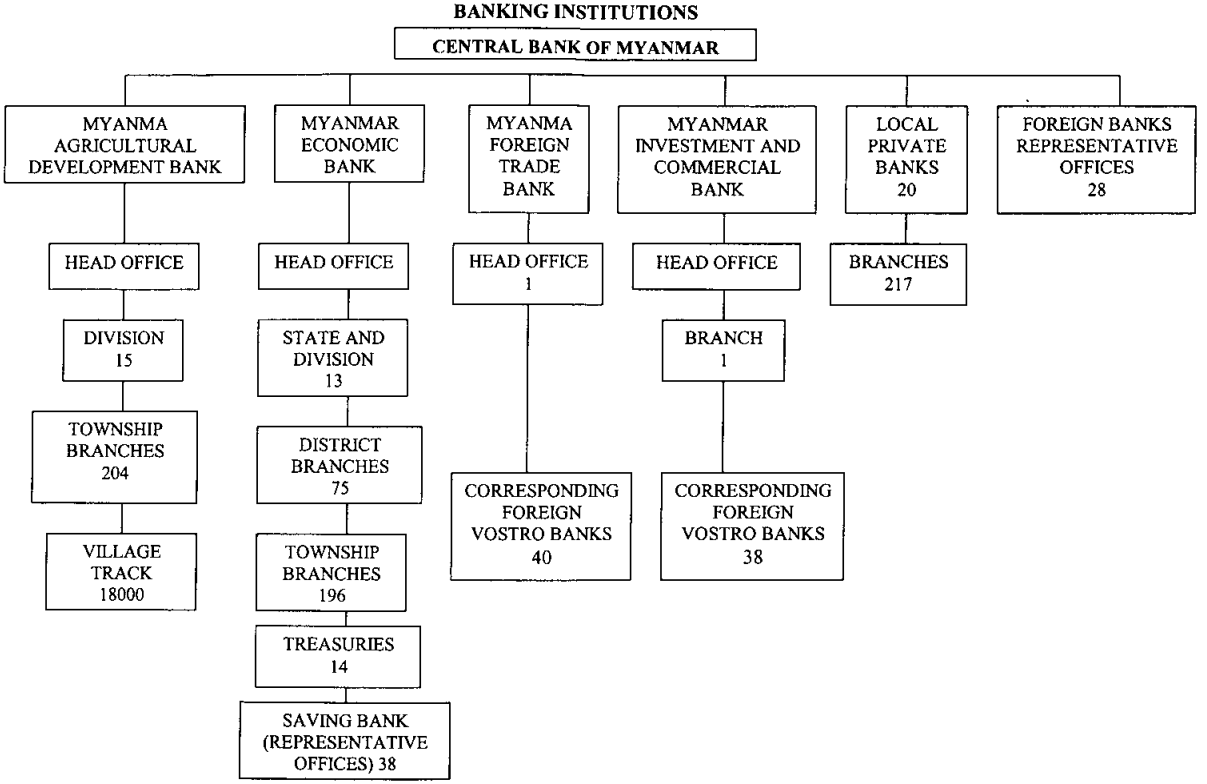
1. See SEACEN Occasional Papers No. 19
2. See Monetary and Exchange Affairs Department, IMF, MAE Operational Paper

Taking its important role in the banking vernacular, the Central Bank of Myanmar provides account services to virtually the entire banking system. Commercial banks hold nostro accounts with the central bank. Balances held in central bank vostro accounts are non-interest bearing. The nostro accounts that commercial banks hold with the central bank are used to make interbank payments using central bank money. Payment using central bank money ensure the claim and an institution cannot fail and will never suffer a shortage of liquidity.

The Central Bank of Myanmar provides clearing and settlement services. Moreover, taking advantages of its role as the issuer of settlement money, the central bank provides large value fund transfer services through its Mandalay branch and branches of the Myanmar Economic Bank, which keeps the currency chests for the central bank in other major cities.

Therefore, the Central Bank of Myanmar leads in the development of payment and settlement system of Myanmar. As private commercial banks have increased their role in convenient and efficient banking services, the central bank is able to support more reliable payment and settlement systems. The Central Bank of Myanmar needs to consider the computerisation of its clearing and settlement services. It should also consider establishing a Bank Card Centre as a non-profit organisation consisting of all card issuing banks for more manageable and efficient card payments.

Annex 1


BANKING INSTITUTIONS
CENTRAL BANK OF MYANMAR
MYANMA AGRICULTURAL DEVELOPMENT BANK
MYANMAR ECONOMIC BANK
MYANMA FOREIGN TRADE BANK
MYANMAR INVESTMENT AND COMMERCIAL BANK
LOCAL PRIVATE BANKS 20
FOREIGN BANKS REPRESENTATIVE OFFICES 28
HEAD OFFICE
HEAD OFFICE
HEAD OFFICE 1
HEAD OFFICE
BRANCHES 217
DIVISION 15
STATE AND DIVISION 13
BRANCH 1
TOWNSHIP BRANCHES 204
DISTRICT BRANCHES 75
CORRESPONDING FOREIGN VOSTRO BANKS 40
CORRESPONDING FOREIGN VOSTRO BANKS 38
VILLAGE TRACK 18000
TOWNSHIP BRANCHES 196
TREASURIES 14
SAVING BANK (REPRESENTATIVE OFFICES) 38

BANKING INSTITUTIONS IN MYANMAR

1. Central Bank of Myanmar

2. Commercial Banks

a) State-owned

1) Myanma Economic Bank
2) Myanma Foreign Trade Bank
3) Myanma Investment and Commercial Bank
4) Myanma Agriculture Development Bank

b) Private Banks

1) Myanmar Citizens Bank Limited
2) Cooperative Bank Limited
3) Yadanabon Bank Limited
4) First Private Bank Limited
5) Maywaddy Bank Limited
6) Yangon City Bank Limited
7) Yoma Bank Limited
8) Myanmar Oriental Bank Limited
9) Myanmar May Flower Bank Limited
10) Tun Faoundation Bank Limited
11) Kanbawza Bank Limited
12) Asian Yangon International Bank Limited
13) Myanmar Universal Bank Limited
14) Asia Wealth Bank Limited
15) Myanma Livestock and Fisheries Development Bank
16) Myanma Industrial Development Bank Limited
17) Sibin Tharyar Bank Limited
18) Cooperative Farmers Bank Limited
19) Cooperative Promoters Bank Limited
20) Innwa Bank Limited

3. Foreign Bank Representative Offices

1. The Development Bank of Singapore ltd.
2. United Oversea Bank Ltd.

3. Oversea-Chinese Banking Corperation Ltd.
4. Overseas Union Bank Ltd. Singapore
5. Malayan Banking Berhad (MAYBANK), Malaysia
6. Public Bank Berhad, Malaysia
7. Global Commercial Bank, Phnom Penh
8. Bangkok Bank Public Company Ltd.
9. Arab, Bangladesh Bank Ltd
10. Krung Thai Bank Public Company Ltd
11. Standard Chartered Bank (UK)
12. Societe General (France)
13. National Bank Ltd.
14. Brunei Investment Bank (BIB)
15. ING Bank
16. Deutsch Bank Aktiengesellschaft
17. First Overseas Bank Ltd.
18. The Sumitomo Bank Ltd.
19. The Tokai Bank Ltd.
20. The Dai-Ichi Kangyo Bank Ltd.
21. Credit Lyonnais
22. The Bank of Tokyo-Mitsubishi, Ltd.
23. First Commercial Bank, Singapore Branch
24. Credit Agricole Indosuez
25. Natexis Banque
26. Kepple TatLee Bank Ltd
27. Bumiputra-Commerce Bank Berhad
28. BNP PARIBAS

Annex 3

Domestic Private Banks
(as of 31 March 2001)

(in million kyats)

Name	Paid -up Capital	Reserve Fund	Total Deposits	Total Loans	Date of Inauguration
1. Myanmar Citizens Bank Limited	110.00	191.60	3427.30	1535.90	2-6-1991
2. Cooperative Bank Limited	143.50	86.70	3742.00	3327.90	21-8-1992
3. Yadanabon Bank Limited Mandala	161.00	18.70	132.40	244.50	11-9-1992
4. First Private Bank Limited	654.10	227.40	6495.80	3832.00	6-10-1992
5. Myawaddy Bank Limited	1020.00	883.60	19795.70	8391.30	4-1-1993
6. Yangon City Bank Limited	800.00	93.10	4808.40	2696.30	1-4 -1993
7. Yoma Bank Limited	1400.00	670.60	69029.70	39325.20	14-8-1993
8. Myanmar Oriental Bank Ltd.	327.60	362.00	14742.70	9718.20	18-11-1993
9. Myanmar May Flower Bank Limited	2000.00	523.80	33057.2	22343.40	9-6-1994
10. Tun Foundation Bank Limited	270.00	84.90	2251.80	1614.50	14-6-1994
11. Kanbawza Bank Limited	2485.00	5.00	13096.40	8559.20	1 -7 - 1994
12.Asian Yangon International Bank Limited	50.00	6.40	215.10	174.90	18-10-1994
13. Myanmar Universal Bank Limited	900.00	76.70	11109.20	5500.80	23-2-1995
14. Asia Wealth Bank Ltd.	2441.60	3754	144930.7	84574.60	30-4-1995
15. Myanmar Livestock and Fisheries Development Bank Ltd	725.00	210.50	3561.70	4363.70	15-2-1996
16. Myanma Industrial Development Bank Ltd.	1208.00	273.70	2405.90	1497.90	15-2-1996
17. Sibin Tharyar Yay Bank Ltd.	945.90	100.50	857.20	1532.60	4-7-1996
18. Co-operative Farmers Bank Ltd.	300.00	5.20	331.70	389.90	6-7-1996
19. Co-opeartive Promoters Bank Ltd	129.50	14.40	1068.40	877.70	6-7-1996
20. Innwa Bank Ltd.	400.00	226.30	7345.60	2980.60	28-11-1997
Total	16471.20	7815.10	341404.90	203471.00	

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Chapter 6

THE PAYMENT AND SETTLEMENT SYSTEMS IN NEPAL

by

Jagadishwor Prasad Adhikary

1. Introduction

1.1 Historical Background

The history of banking in Nepal may be described as a component of the gradual and order in the financial and economic sphere of the Nepalese life. Even now, the financial system is still in the evolutionary phase. The existence of unorganised money market consisting of landlords, shahukars (rich merchants), shopkeepers and other indigenous individual moneylenders has acted as a barrier to the institutional credit. These institutions although quite underdeveloped, could still mobilise funds from a wide range of different sources. For many years, the indigenous individuals, wealthy agriculturists, landlords, merchants and traders conducted some banking activities but were fragmented and mostly localised in nature. In view of this, the Nepal Bank Ltd. was established with the objectives to accept deposits, to extend credit facilities for the promotion of trade, cottage industry and agriculture, to render customer-related services, to invest in government bonds and securities, to perform agency functions and to act as banker to the government. NBL was the only commercial banking institution until the establishment of another commercial bank, the Rastriya Banijya Bank (RBB) in 1966. It had a free hand in the commercial banking business of the country, such as import and export trade.

The Nepal Rastra Bank (NRB) was established as a central bank on 26 April 1956. The Bank was empowered to have direct control on all banking institutions within the country. The steps towards modernisation of the treasury function and stabilisation of exchange rate was initiated under the right earnest concept. Nepal Rastra Bank introduced the NRB Clearing house in 1968 and joined the Asian Clearing Union (ACU) in 1974, It had also established legal frameworks on payment instruments such as credit cards, ATM system etc. Some commercial banks have taken membership in the SWIFT system. The NRB started the foreign currencies clearing in 2000.

1.2 Methods of Making Payment and Settlements

Cash and paper-based instruments such as cheques and commercial bills, are still generally used in Nepal. In rural areas, which cover almost 75 percent of country's area and population, cash is generally used while in urban areas, current account cheques are mainly used by corporate sector for high value transactions along with commercial bills as payment instruments. In the capital city, some people use ATM cards and credit cards.

1.3 The Institutions that Provide Payment and Settlement Services

The Nepalese financial sector can be divided into two, namely the banking institutions and the non-bank financial institutions. The banking institution comprises the Nepal Rastra Bank (NRB, fifteen commercial banks, five development banks and five grameen bikash banks (rural development bank). The non-bank financial institutions comprises 45 finance companies, 10 contractual saving institutions (Employees Provident Fund and Insurance Companies), 34 cooperative financial institutions, 13 non governmental organisation (NGOs) conducting limited banking activities, postal saving offices, and Nepal Stock Exchange Ltd. Of the fifteen commercial banks, two are government-controlled, five are private and the rest are joint venture banks. These institutions provide payment and settlement services.

1.4 Legal Framework

The legal framework on the payment system in Nepal is neither very clear nor transparent. There is no existing law on the payment system. In the absence of specific acts, the legal framework of the payment system are based on the various Acts such as Nepal Rastra Bank Act 1955, Commercial Bank Act 1974, Foreign Exchange (Regulation) Act 1962, and negotiable instrument Act 1977. All these acts do not specifically provide the payment procedure. Although the Negotiable Instrument Act clearly defines the role and responsibility of the related parties that deal in negotiable instruments, it is not yet effective in the absence of notary public system. To cope with these situations, the Nepal Rastra Bank has made arrangements regarding the effective payment procedure in accordance with the legal authority under said Acts.

The Foreign Exchange (Regulation) Act, 1962 spells some payment system regulations on Payment for Exports, Receipt of Payments for Exported Goods, Restrictions on Making or Obtaining Payments etc. The Ne-

pal Rastra Bank being the central bank of the country, exercises its legal authority to regulate the commercial banks. The Foreign Exchange Department of the NRB is tasked to regulate, inspect and supervise different aspect of foreign currency transactions.

2. Existing Payment and Settlement Systems

2.1 Domestic Payments

2.1.1 General Overview

The domestic payment system comprises cash for small-value transfer, and cheque, drafts, telex transfers for large value payments in all organised enterprises, contractors, business houses. Recently, three joint venture banks started issuing ATM cards in Kathmandu. However, the number of cardholders is negligible. The use of travelers cheques in domestic currency has not been popularly accepted either.

The Nepal Rastra Bank conducts clearing house interbank payment systems through its nine banking branches in different cities, and the only systematic payment unit in the banking system. The payment system of the commercial bank branches, which are member of the clearing house, is also settled through the clearing houses. The settlement is based on multilateral transactions among the clearing members. Each member should have account at a certain central bank branch.

The payment system in the domestic market has not been clearly guided by any regulation in the country. However, some process on the payment instruments are defined by the Negotiable Instruments Act (NIA). NIA is the codification of a long settled practice on custom and usage relating to payment and transfer of money of the merchants of European continent. The sole objective of this law is to set rules relating to payment and transfer of money through instruments instead of currency notes or coins to make monetary transaction easier.

In Nepal, promissory note, bills of exchange and cheques have been legally recognised as negotiable instruments. Any documents which entitles a person to a certain right and transferable by mere delivery are accepted as negotiable instruments. However, negotiable instruments such as bearer

share certificates, bearer debentures/bonds, dividend etc. are yet to be practiced in Nepal.

2.1.1.1 Nepal Rastra Bank Clearing House

As bankers' bank, one of the most important function of the Central Bank is to operate an interbank clearing house. The Nepal Rastra Bank, in its capacity as the central bank has been conducting clearing house inter-bank payment systems since 1968. All commercial banks are members of the clearing house. Since Nepal Rastra bank holds the reserve balance of commercial banks; it can transfer funds from one bank to another bank to facilitate clearing of cheque. The Nepal Rastra Bank operates clearing house activities in nine banking branch offices in different parts of the country to transfer and settle claims of banks. The transactions of any commercial bank branch that is a member of the clearing house can be settled through it. Cheques, drafts, and telexes are the instruments used to settle the accounts and cleared in the clearing houses. The settlement of the multilateral transactions among the clearing member is made through their account, maintained at the NRB. Each member banks has an account at a certain central bank.

2.1.1.2 Activities Regarding the Payment System in the Domestic Market

a. Promissory Note

Promissory Note is an instrument in writing containing an unconditional undertaking to pay a certain sum to or to the order of a specified person or to the bearer of the instrument and is duly signed by the maker. However, the bank note or currency note is not considered as a promissory note as this is dealt under separate statute.

b. Postal Saving Banks

The concept of Postal Saving Banks was introduced in 1977 with an intention to promote the saving habits among the rural people where small savers become reluctant to go to the banks. The number and volume of savings captured by the postal saving system is very small, in spite its network in all the 75 districts of the country.

c. Nepal Stock Exchange

The Nepal Stock Exchange Ltd (NSEL) replaced the Securities Exchange Centre in 1992. With the increase in the number of companies listed in the NSEL from 107 to 110, shares in the market activities were on an upward trend during the FY 1990/00. The NEPSE Index went up from 216.9 in mid July 1999 to 360.7 in mid July 2000.

d. National Saving Bond and Development Bond

With a view to finance the government budget deficit, the NRB, on behalf of the government, issues long term government bonds such as National Saving Certificates and Development Bonds. Generally, National Saving Certificate is issued for a period of 5 years at an interest rate determined by the authority, especially for the non-banking sectors. Development Bond, on the other hand, is issued generally for 3 years period especially for banking sector at the pre-determined interest rate.

e. Treasury Bills

As part of the financial liberalisation policy, monetary policy stance shifted from direct to indirect methods since 1989/90. In accordance with the shift, NRB laid emphasis on open market operations as the main policy instrument. For the open market operation, auctioning of the Treasury Bills was introduced in November 1988. The 91-day Treasury Bills used to be issued once a month at irregular interval. However, the auctioning of the Treasury Bills has been on a weekly basis since November 1989. The primary issue takes place each Tuesday of the week and the secondary market transaction of these bills can take place throughout the week. Two to three days before each auction, the NRB announces through the press, the amount of Treasury Bills to be auctioned and the deadline for submitting the bids in accordance with the discount rate listed in the previous auction. After examining the bids, allocation is made on the basis of first priority to the lowest interest bidder. If the bid is abnormally higher than the trend or if the open market operations committee feels that the bid is distorting the market situation, it can impose discretionary cut-off rate for each auction. Settlement takes place on the day of the auction, by charging directly on the banks' deposit (reserve) accounts in NRB.

The domestic payment system generally makes use of cash, cheques, and draft telex / Telegraphic transfer (TT), mail transfer (MT) etc.

2.1.2 Payment Methods

2.1.2.1 Cash (Bank Notes and Coins)

In Nepal people generally conduct their transactions in cash for both personal or, in business transactions. In as much as the banking network in the rural area is not as strong, people prefer to hold cash for their transactions. As such it becomes imperative for Nepal Rastra Bank to circulate bank notes in larger volumes each year.

At present, Nepal Rastra Bank has issued currency notes with denominations of Rs. 1,2,5,10. 20,25,50,100, 500, and Rs.1000.

During the fiscal year 1999/00, the currency in circulation expanded by 20.5 percent (Rs 7.16 billion) and stood at Rs. 42.14 billion in mid July 2000. In the preceding year, currency had risen by 13.2 percent (Rs.4.09 billion). The reduction in the working days per week from six to five days and the expansion of activities of financial institutions other than commercial banks, helped increased the currency holdings outside the monetary sector.

2.1.2.2 Cheque

Cheque is the second most important payment instrument for small value and large value payments. It is through a cheque that the depositor directs the bank to make payments. Since cheque is regarded as the most developed credit instrument in the money market, most of the modern business transactions consistently have been using cheques in settling their accounts. .

2.1.2.3 ATM Cards

Current and savings account holders are eligible to avail the ATM services subject to the minimum balance requirement to be maintained in their account. No charges are levied for using the ATM facility and the issuance of the ATM card.

Presently, only two commercial banks have issued ATM cards, since most of the account holders in Nepal are not familiar with this system. The value and the volume of transactions in this system are negligible.

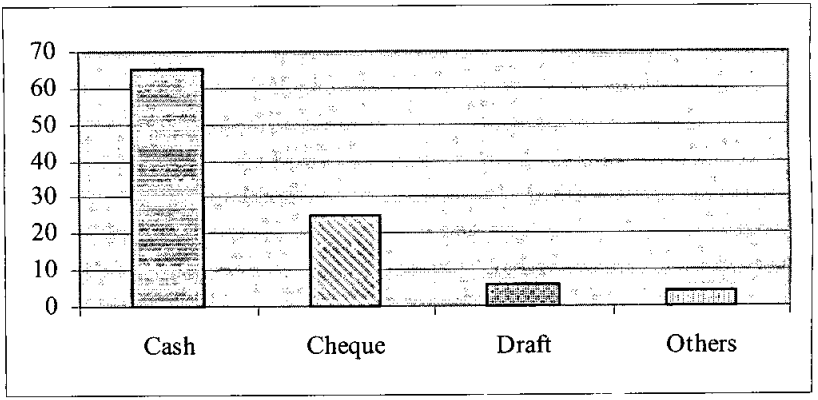
2.1.2.4 Banker's Cheques or Manager's Cheques

Banker's cheques or manager's cheques are issued as a service extended to the customers and a means of transacting business to the Bank. The cheques are printed on security paper, pre-numbered as well as prepared in conjunction with a manifold set of forms, which include an advice to the customer, advice to payee and a register copy.

All managers' cheques which remain outstanding for a period over 6 months from the date of issue should be transferred to bills payable under their respective subsidiary accounts. The operating branch should approve all debits to these accounts.

2.1.2.5 Analysis of the Payment Instruments

The payment instruments, which are used domestically in Nepal, are Cash, cheque, draft, telex transfer, mail transfer, traveller's cheque, Nepalese Rupee credit card and ATM system. There are only four ATM machines in the capital of the country and are being operated by a commercial bank. However, they have not been able to contribute much in the payment system. Similarly the Nepalese Rupee credit card which has been introduced by a commercial bank has not become effective either. The use of traveler's cheque too has not been so effective in Nepal due to the cash preference of the Nepalese people. Over the last decade, the Nepalese pay-



ment system has made some progress in replacing cash by other instruments like cheque, draft and TT. As the banking network in the country is not strong and the people in the rural areas are not familiar with the banking system, the Nepalese people prefer to transact in cash. Generally, consumers, businessmen, government and government enterprises used cheques for both small and large value payment. Cheque payments are slowly becoming the next important payment instrument in the country, while draft is also slowly picking up as a payment instrument.

The diagram shows the usage of different payment instruments in the country. As shown in the figure, 65 percent of the domestic payment and settlement transactions in Nepal is made through cash and 25 percent of such transactions are made through cheque. Transactions made through drafts and various other instruments constitute 6 percent and 4 percent respectively.

2.1.3 Structure, Operation and Administration

2.1.3.1 Nepal Rastra Bank Clearing House

The clearing house in Nepal Rastra Bank was established in 1968. Currently there are nine branches operating in different cities of the country that conduct clearing house activities for the inter Bank Payment Systems in the country. The clearing house is a medium for the presentation and settlement of cheques, drafts and similar payment orders among the member banks.

a. Participants in the System

All commercial banks are allowed to participate in the clearing system. Presently, there are 83 bank branches that have taken membership of the clearing house. The branches of commercial banks participate in the clearing system through their head office which number about 15 head offices. All clearing member banks need to have a transaction account with Nepal Rastra Bank.

b. Types of Transactions Handled

The Nepal Rastra Bank Clearing House facilitates clearing of cheques drafts and similar payment orders in Nepalese rupees as well as in eleven foreign currencies viz., USD, EUR, GBP, DEM, CHF, AUD, CAD, NLG, SGD, FFR, and JPY.

c. Operation of the System

There are two meetings conducted every business day. On the first meeting, which is scheduled at 9:30 a.m., all the payments instruments such as cheque, drafts etc. are presented. While on the second meeting held at 2:30 p.m. payments are made to all these instruments if it is accepted otherwise they are simultaneously returned during this time.

Operation Procedure:

- All outward clearing items representing cheques drawn on the member banks of the clearing house are first listed and the necessary clearing schedules are prepared. The total number of cheques and aggregate amount is then agreed upon by all the concerned members. The cheques and schedules are then delivered to the representatives of the various banks at the clearing house for clearing purposes.
- Separate list shall then be prepared in duplicate copies for each Bank.
- The receiving member shall immediately check each delivery and any discrepancy noted shall be adjusted within the clearinghouse and certified by the clearing house officer.
- Individual lists shall then be checked and signed by the representative of the concerned member Bank.
- After all the deliveries have been exchanged, each member shall complete its clearing house statement to arrive at the net amount due to or due by itself. The representative of each Bank shall then fill in the summary form, which includes the net amount due to or due by his bank and sign against it. After balancing the summary form the officer signs it certifying the Clearing Bank's account in the books of Nepal Rastra Bank which shall be debited or credited as the case may be. After the presentation of the forms have been prepared and signed, each member shall then submit a copy to the clearing house officer.

In case of any dispute, the matter may be referred initially to the clearing house officer. In the event that the officer is unable to resolve the dispute, reference shall be made to the senior management of the banks involved. Should that course of action not resolve the problems, the clearing house committee shall then be convened.

d. Volume of Transactions Handled

The volume and value of clearing transactions are increasing every year. The total transactions, which were settled through the clearing house,

amounted to Rs.156570 million in the year 1999. The amount was higher by Rs. 26980 million from the previous year. The volume (number) of cheques totaled 274.5 thousand in 1999. The volume was higher by 13% of the previous year. (See Table 8 & 9).

e. Settlement Procedure

Each member bank must maintain a transaction account with a minimum balance of NRs 50,000.00 with the Nepal Rastra Bank. The net clearing figure of each member bank shall then be debited and/or credited to its account. Where the transaction/ clearing account is overdrawn, the Bank shall replenish it within 24 hours to create a credit balance out of which claims on it shall be paid.

Unpaid items, which have been presented through the clearing house, must be returned through the clearing house itself. The member banks are informed about the clearing house details of unpaid items at around 2:30 p.m. on the same clearing day. The clearinghouse officer will then raise a separate debit voucher regarding the returned item to be debited/credited to respective member banks' account.

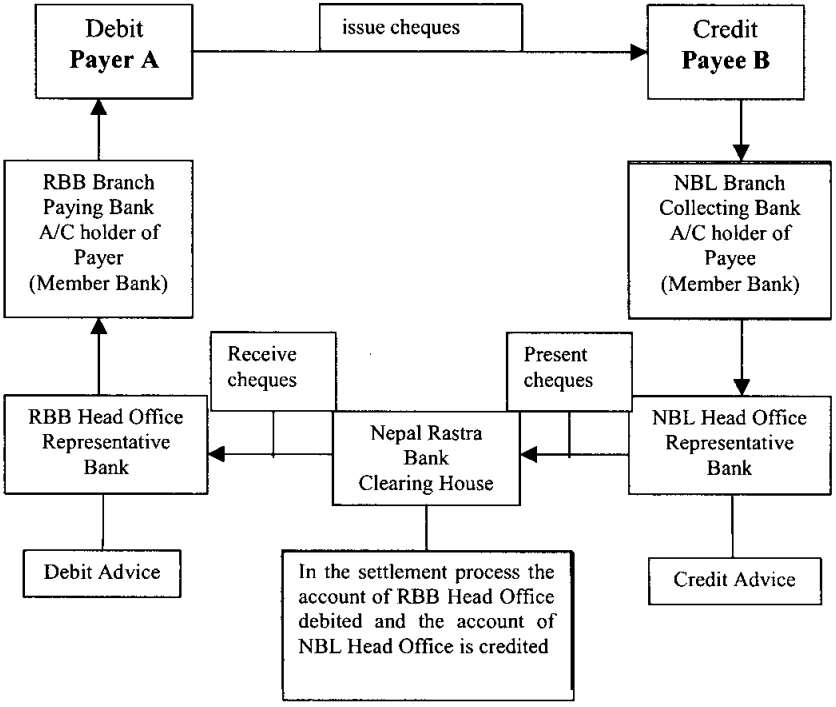
All instruments that are not returned shall automatically be deemed to have been paid by the drawee bank. Each unpaid item should bear, on an attached slip, reasons for the refusal of the payment. Such statements should be written in full and not abbreviated.

f) Pricing Policies

As far as the payment and settlement activities on domestic cheques, drafts etc. are concerned; the member commercial banks do not have to pay any amount. They just need to pay the membership fee amounting to Rs 2000/- annually.

Regarding the inter-bank clearing of foreign cheques, drafts, etc, the commercial banks are required to pay for the communication charge such as telex, mail, courier etc. However, they need not pay any service charge to the Central Bank.

Nepal Rastra Bank
Clearing House
Cheque Clearing System



g. Management of Risks

It is also to be noted that precautionary measures were taken into account to minimise the risks. In the domestic payment system, the member banks are obliged to open an account with a minimum balance at the central bank and this would take care, to certain a extent, the risk arising from liquidity shortage. As far as the systematic risk is concerned, this risk is minimised since the summary form is balanced in the presence of all the member banks and only then it is signed by the clearing house officer. The system hardly incurs credit risk, since the payment instructions are executed only if there are sufficient funds in the participants' account. There is no credit risk involved if payments are accepted while recipients are notified after the payments are settled.

2.2 Cross Border Payments

2.2.1 General Overview

Cross border payment system in Nepal is still at its primary stage. Most of the commercial banks use traditional payment instruments. The Foreign Exchange Department of NRB monitors the foreign currency transactions. Recently, Nepal Rastra Bank started the local clearing for the payments in eleven foreign currencies viz. USD, EUR, GBP, DEM, CHF, AUD, CAD, NLG, SGD, FFR and JPY.

The payment instruments, which are used externally, and involve foreign exchange payments, are foreign currencies, travelers-cheques, cheques, drafts, telex transfer, credit cards and letters of credit. The external payment system can be divided into two groups: a payment system for Indian currency and for other convertible currencies.

2.2.1.1 Payment and Settlement System for Indian Currency

Under the Foreign Exchange (regulation) Act of 1962, the Indian currency also comes under the definition of foreign currency but the exchange regulation towards Indian currency is very soft and liberal due to the bilateral payment arrangement, open border, geographical proximity and the historical and cultural relations between India and Nepal. For the purposes of receipt and payment accompanied by documents, it is convertible to both the Nepalese and Indian citizens. However, for retail transactions, a maximum of INR 25,000 can be exchanged at a single time. For trade purposes, telex transfers are the prevailing method for advance payment, deferred payment, bill of transport, letter of credit, with bills of transport being the most popular method. The trade payment between Nepal and India is settled in Indian rupees. Payments for the import or export of commodities from India are effected in cash through drafts and TTs. Thus, a letter of credit is not an essential element. A letter of credit is essential if payment is to be made in US dollars for some specified Indian machinery and industrial raw materials. Nepalese commercial banks have maintained their Indian currency agency accounts in Indian banks to settle the above payments.

2.2.1.2 Payment and Settlement System for Other Convertible Currencies

The Nepalese foreign exchange regime is partially liberalised. Current account transaction is convertible under the regulatory framework, whereas capital account transaction is not convertible. All capital account transactions are subject to the prior approval of the government or the Nepal Rastra Bank. Nepal Rastra Bank Act and Foreign Exchange Act empower NRB to regulate the foreign exchange policy. These Acts ensure that the inflows and outflows of foreign exchange could be properly channeled.

However, anybody who wants to deal in foreign exchange should get a license from the Central Bank. Nepalese nationals who have a source of income in a foreign currency, can open a convertible account with designated commercial banks and are eligible to hold and international credit card. Payments can be made with a credit card but there are specific guidelines to be followed.

Authorised moneychangers, hotels, travel agencies and banks can accept foreign currencies in cash, travelers' cheques and credit cards. Any foreign or Nepalese national who wants to receive a payment from abroad can receive it in the form of a telex transfer, bank cheque, draft, mail transfer, etc. Presently, eight commercial banks have started to use SWIFT, which enables money for foreign payments to be transferred efficiently.

Since Nepal is a member of the Asian Clearing Union (ACU), all the trade payments among member countries except India are settled through the clearing system of the Union in ACU dollars. Moreover, some restrictions are imposed on the usage of foreign currencies since the Rupee is not convertible.

When any person desires to remit foreign currencies, he/she may request the bank to transfer the funds. Funds transfer may be allowed on his/her written request against the value received. The request of payment made by the client may be entertained through any of the following modes:

* Drafts.
* Mail Transfer (MT)
* Telex Transfer (TT).
* Swift transfer.
* Credit cards
* ACU dollars.

2.2.2 Payment Methods

Transfer of funds from one place to another or from one account to another is one of the most important jobs that a commercial bank performs. It can either be for the execution of a customer's request or on the bank's own initiation for the settlement of trade payments or treasury dealings. Fund transfer can have a very wide range of possibilities in terms of the distance and the relationship between the banks involved viz.,

* Transfer from one account to another within a bank.
* Transfer from one branch of a bank to another branch.
* Transfer from one bank to other banks having accounting relationship.
* Transfer from one bank to another having no relationship at all (national or international).

While all these options differ from each other, funds can be transferred easily in each case. A transfer between any two banks can be conducted with the help of an account on either bank. The paying party simply pays while the receiving party receives funds into that account.

A number of methods or instruments are used to facilitate foreign payments, which include among others, the following:

2.2.2.1 Drafts

The system supports issuance of drafts in any currency. Foreign currency drafts are issued subject to the Central Bank regulations. Extra care is to be exercised while processing requests for foreign currency drafts. The system has to be updated with the correspondents with whom the bank has an arrangement to draw draft in different convertible currencies. A draft drawn by one branch of the bank upon another branch can be treated as either a Bill of Exchange or a Promissory Note. For the purposes of law (and unless otherwise provided by law), all the branches of any bank operating within Nepal shall be treated as one bank. Since in such a situation the drawer and the drawee are the same, it will be treated as a Promissory Note.

All drafts, which remain in outstanding for a period of over 6 months from the date of issue, should be transferred to Bills Payable under their respective subsidiary accounts.

2.2.2.2 Mail Transfer (MT)

Mail Transfer is also an instrument containing instruction from the issuing bank to the responding bank to pay a certain sum of money to a certain beneficiary. This is generally used where the account details of the beneficiary are available. The issuing bank usually sends the instrument to the responding bank, which executes the payment upon receipt of the same. Mail transfer is cost effective but not time-efficient. The authenticating mechanism is the verification of the signatures. It is not appropriate for settlement of the treasury payments. Practically, this instrument is slowly fading away.

2.2.2.3 Telegraphic Transfers (TT)

This is widely used instrument in funds transfer in Nepal. The system supports issuance of telegraphic transfers in any currencies. As in the case with drafts, transfers in foreign currencies are subject to NRB regulations. Telegraphic transfers will be issued to any of the correspondents subject to test key arrangements, which by their nature make it essential to utilise the services of a correspondent bank in the nearest city to the location of the beneficiary, irrespective of the accounting relationship.

2.2.2.4 SWIFT

SWIFT was established for the purpose of creating and operating a specialised data processing and telecommunication system to process interbank financial transaction instructions between member banks in a automated and highly secure environment. Swift does not create or execute banking transaction; these functions are reserved to banks. Swift is a service organisation dedicated to meeting a number of specialised service needs relating to interbank financial transactions.

Transactions covered under swift are customer transfers, bank transfers, foreign exchange confirmations, credit/debit confirmations, statements, collections, documentary credits and trading of interbank securities.

2.2.2.5 Credit Cards

Commercial banks can issue credit card to any Nepalese and/or foreign currency account holder where the bank acts as an agent on every issue. Cards can be issued to customers by the bank provided it is within

the limit allocated to the bank. The card issuer reserves the right to decline any new application where its issuance leads to excess in the allocated limit.

All cardholders are charged with a minimum initial enrolment fee and annual subscription fee as fixed by the card issuing companies.

Currently, only three commercial banks have issued credit cards. The value and volume of transactions is insignificant since this instrument is new to the Nepalese account holders.

2.2.2.6 Asian Clearing Union (ACU)

The ACU was established in 1975 with the following objectives:

- providing the facility to settle, on a multilateral basis, payments for current international transactions among the participating countries,
- promoting the use of participants' currencies in current transactions between the respective territories thereby effecting economies in the use of participants' exchange reserves, and
- promoting monetary cooperation among the participants and closer relations among the ACU banking systems.

The central banks of Bangladesh, Bhutan, India, Iran, Myanmar, Nepal, Pakistan and Sri Lanka are members of ACU. Nepal is one of the founding members.

When ACU started its operations in 1975, all individual transactions were required to be cleared through the concerned central banks. According to the ACU agreement, all payments relating to trade and trade related transactions among member countries should be routed through the ACU payment systems. Under this system, payments arising on trade transactions with member countries are first settled by the respective commercial banks with their central banks and thereafter a request to settle the same is made to the corresponding bank of the member country (receipt bank). In turn, the respective central bank advises the central bank of recipient member country to settle that payment with the corresponding recipient commercial bank. The central bank of the recipient's member country then settles the payment with their local commercial bank and instructs the ACU to credit their accounts as well as to debit the paying member central bank's accounts maintained at ACU head office. Interest is debited or credited to the account at the end of the day, depending on debit or credit balance in the account. All the settlements are made in US dollars.

The ACU head office maintains accounts in ACU dollar for each member central bank and updates the debit and credit entries as advised by the respective member central banks. At the end of the settlement period, i.e. two months, the ACU informs the net position of each bank (debit or credit) for the final settlements among member central banks. There is no cross border fund transfers during the settlement period i.e. two months. The cross border settlements takes place only after final settlements are made among themselves by member central banks.

2.2.2.7 Transaction under ACU

The total transaction which was settled through ACU amounted to Rs. 549.4 million (ACU dollar 7.8 million) during the year 2000. The amount was lower by Rs. 1 billion (ACU dollar 15.1 million) from that of the previ-ous year. Total export of goods settled under the ACU registered a decline of Rs.524.1million (ACU dollar 7.8 million) to Rs. 181.5 million (ACU dollar 2.6 million). This indicated a 74.3 percent decline in rupees terms and 75.2 percent decline in ACU dollar terms. Similarly, total import also decreased by 56.9 percent (Rs. 485.1 million) to Rs. 367.9 million. In ACU dollar terms, import transactions were lower by 7.3 million. The previous year saw a relatively huge size of imports through ACU. The overall balance transaction showed a negative position as in the preceding year.

2.2.3 Structure, Operation and Administration

a. Participants in the System

Generally, Nepal Rastra Bank and commercial banks are involved in cross border payment and settlement system. At present, fifteen commercial banks are involved in the cross border payment system. The commercial banks are free to conduct transaction of payment and settlement of current account on their own since current account transaction is fully convertible. On the other hand, commercial banks need to have prior approval with the Nepal Rastra Banks in making transactions in the capital account since it is not fully convertible.

b. Types of Transactions Handled

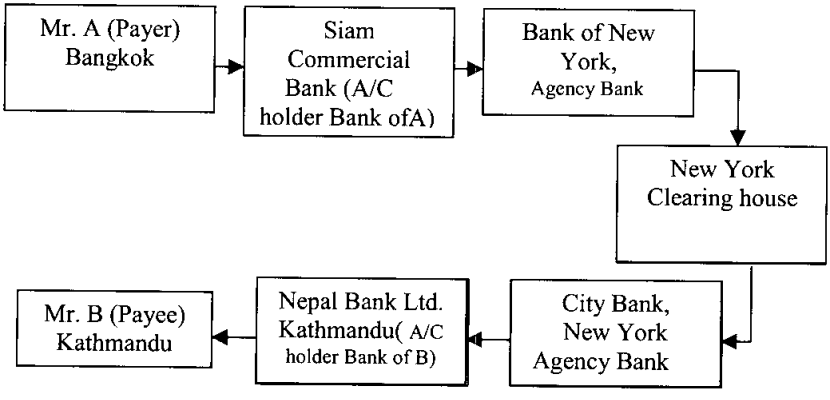
Nepal Rastra Bank is involving in the collection and disbursements of government loan as well as handles all the cross border transaction of the

government In the case of the private sector and business houses, the commercial banks handle all the small or large value cross border payments.

c. Settlement Procedure

Generally, Nepal Rastra Bank and commercial banks have an accounting relationship with various correspondents/ agency banks in different currencies. Payment will not be made if bank does not maintain any accounting relationship with that corresponding bank. The net payment figure of each agency bank shall be debited and/ or credited to its account and thus the settlement is made.

For example, Mr. A from Bangkok pays some money to Mr. B in Kathmandu. If there is no agency relationship between Siam Bank and Nepal Bank Ltd., the payment and settlement procedure of the bank will be conducted as follows.



The above Chart shows that six different transfers have been combined together to form a single payment and settlement procedure.

3. The Implications of the Existing Payment and Settlement Systems for the Financial Stability

It is a universal truth that payment systems all over the world are the prime vehicle through which any central bank implements its monetary policy. As such the monetary implication of the payment system is to be understood. Commercial banks usually maintain two types of accounts/reserves with the Central Bank, namely, the clearing account and the statu-

tory reserve requirement account. These accounts are non-interest bearing and form the primary reserve money base. Nepal Rastra Bank can influence money supply through changes in the reserve money, either through changes in the required reserve ratios i.e. the statutory reserves requirement or through open market operations. Depending on the structure of the clearing bank's accounts with NRB, the design of the payment system will affect the overall bank liquidity.

It is the lags in clearing and settlement that affects the level of float or items in transit, forcing the commercial banks to maintain a certain degree of liquidity or clearing balances that are necessary. Also the willingness of Nepal Rastra Bank to provide daylight overdrafts could reduce the need to hold high amount of clearing balances. In addition, the degree of decentralisation of clearing accounts to the district offices also affects the level of liquidity. Nepal Rastra Bank in consideration of the above points acts accordingly so as to efficiently conduct its monetary management activities.

In Nepal, the non-bank public uses currency and transferable deposits as the settlement media for most economic transactions. Of the two media, the use of currency is predominant. This is evident from the fact that currency constitutes about 70 percent of narrow money (M1) in Nepal. Obviously, the transferable deposits account for the remaining 30 percent.

Reserves at the central bank and transferable deposits at other institutions are the settlement media used by the commercial banks. Every commercial bank maintains an account with the Central Bank of Nepal. The Central Bank of Nepal has also been offering clearing house facility to the commercial banks and some development banks. The settlement of financial claims takes place on the day cheque are brought to Nepal Rastra Bank (NRB) by the representatives of the participating banks. Hence, the system followed is real time net settlement. This refers to simultaneous transmission, processing and net settlement of financial claims.

Apart from currency and cheques, debit cards and credit cards are also used to settle payments. But these media are of recent origin in Nepal. The magnitude of settlement of transactions under these media is rather insignificant.

As regards the securities settlement, both multilateral and bilateral methods are used in Nepal. Treasury Bills are issued through auction both in

the primary market and secondary market. Commercial banks are the dominant participants of the Treasury Bills market. The settlement of payments takes place multilaterally for Treasury Bills. The settlement is done through the NRB as the participant banks maintain accounts with it. Accounts are settled within the day. Settlement of government securities other than Treasury Bills takes place bilaterally.

Cross border settlement is done both bilaterally and multilaterally. Most of cross border transactions take place bilaterally. Payment media used for bilateral settlement are draft, telegraphic transfer and SWIFT. While the former two are mostly used by the NRB, the commercial banks especially joint venture bank use the latter. Most of cross border transactions with India takes place in Indian currency and convertible currencies are used for the transactions with the rest of the world. Multilateral settlement takes place through Asian Clearing Union (ACU). However, the magnitude of transactions is rather insignificant.

3.1 Monetary Policy

The Nepal Rastra Bank Act enables the NRB to use a wide range of instruments for the implementation of monetary policy. The main instruments constantly being used by the NRB are Bank Rate, Cash Reserve Requirement (CRR), Open Market Operation (OMO), Foreign Exchange Intervention and Moral Suasion. The objective of the monetary policy is economic growth together with domestic stability.

With the adoption of economic liberalisation policy, the NRB has been using indirect marked based policy instrument in lieu of direct instruments like SRR, credit and interest rate control. At present, OMO has become the most important and market based instrument for conducting monetary policy. The NRB conducts its OMO to influence and observe liquidity in the money market on the basis of weekly auctioning of Treasury Bills and repo transaction (repurchase transaction) on government securities. However, the NRB has still been using bank rate and CRR as the mechanism for signalling to the market the direction of the monetary policy. In addition, the NRB has also been intervening in the foreign exchange market as per the demand of the economy, which generally occurs due to defacto pegged exchange rate with Indian currency.

The efficiency and effectiveness of monetary policy, thus, are affected by the efficiency and reliability of the payment system.

3.1.1 Timely Information

Currently, the monetary policy framework targets, M1 narrow money in the implementation of monetary policy and reserve money is considered as an intermediate target. With reserve money as the interim target, it is imperative that information on this variable be obtained timely. If the payment and settlement system cannot deliver the relevant information on time as required, the whole targeting framework would fall apart.

Apart from M1, the broad money (M2) is also considered in the monetary policy framework. This an necessary because saving deposits has become much more liquid. One major reason for using reserve money rather than narrow money, as the intermediate target is the time lag in obtaining information on narrow money under the current payment and settlement system. An improvement in the payment and settlement system would enable a faster policy response by reducing time lag.

Money market liquidity assessment is essential for effective open market operation. Such an assessment would require to be made promptly with a longer term forecast. More accurate estimates trend to make OMO more effective. Accurate assessment of liquidity is affected by the payment system.

3.1.2 Effective Conduct of Monetary Policy

The transmission mechanism as well as quick and accurate recording of transactions are two major areas of concern for the implementation of monetary policy. These areas are influenced by the payment and settlement systems. First, the transmission mechanism in Nepal moves from the Treasury Bill auctioning rate, to inter bank rates, to market liquidity, to changes in the lending rates, to credit availability and finally to real variables. The efficiency and effectiveness of this mechanism is vitally affected by the payment and settlement system. Secondly, in view of the fact that monetary aggregates are targets, it is extremely important that these values reflect current conditions. Delays and inefficiencies in the payments and settlement system can distort these variables significantly.

3.2 Payment System Oversight

Regarding the oversight or regulation of the payment system, there are no specific provisions in Nepal as of now. However, the responsibility of

supervision and control over banks and financial institutions has been entrusted to Nepal Rastra Bank under section 23(A) of Nepal Rastra Bank Act 1955. This major responsibility of the monetary authority is being carried out by the Inspection and Supervision Department, which was established in 1984. In order to ensure sound, healthy and efficient operation of the financial system, the Inspection and Supervision Department regularly conducts both off-site and on-site supervision of banks and other financial institutions

Under off-site examination, the Department regularly monitors portfolio structure of the banks and financial institutions to ensure strict adherence to prudential guidelines and various sectoral targets set by NRB.

The off-site examination is also carried out as a basis for on-site inspection. If any lapses are detected thereof in the implementation of financial policies by any bank or financial institution, immediate on-site action is taken to correct such defaults. The on-site examination of banks and financial institution is being carried out regularly by NRB to determine whether the existing laws, rules and regulations issued by supervisory authorities are strictly adhered to, assuring that the policies and procedures are being complied with. On-site inspection is also aimed at evaluating the management and effectiveness of the control system, assuring that there is adequate public confidence in the banking system and assessing the overall financial position of banks and financial institutions.

3.3 Competition/Innovation

In Nepal, no other institution except the Nepal Rastra Bank operates and manages the interbank payments, clearing arrangements and settlement facilities. Presently, there is no legal framework prohibiting membership in the payment system. The NRB has been providing these facilities since 1968.

However, any bank or institution that conduct banking activities and seeks membership into the payment system needs to obtain a license or permission from Nepal Rastra Bank. Commercial banks in Nepal are free to introduce any payment instruments as they feel deem appropriate subject to the mutual understanding and compliance with the directives and operating instruction issued by the Nepal Rastra Bank.

4. Consumer Protection

In designing the payment systems, an active participation of the user is helpful since the system must be convenient, and consumer friendly for it to work efficiently. However, robust and sophisticated the payment system may be, it will not be successful if the participating banks and/or business enterprises do not make full use of the system. Hence, the system design must therefore incorporate ideas and contributions from the major users, who must then agree to the idea that the development of payment system is ultimately beneficial to their operations, in terms of costs and convenience. Usually the commercial banks do not like to be forced to use a centralised system, when they feel that they can and should be allowed to develop their own intra-bank system.

Consumer groups are very interested in the efficiency and quality of service of payment mechanism. A comment from most consumers usually has to do with the high level of service charges.

In Nepal all, domestic payments and settlement activities are done through the clearing house, which is within the central bank. In case of domestic payment the central bank does not impose any service charges; whereas for the cross border payments, the charges for communication viz. telex, telephone, mail etc. has to be borne by the concerned banks.

5. Recent Payment System Development and Policy Initiatives

The foreign exchange management system of Nepal, though regulated, has been liberalised significantly in recent years. Some specified payment can be made directly through the commercial banks and other than those specified payment can be made after receiving the prior approval from NRB. Over the past few years, Nepalese banking system has made significant progress in the development of the payment system. NRB has established some legal framework regarding some payment instruments like credit card, ATM system etc. Presently, eight commercial banks have already taken membership in the Swift system and other banks have been encouraged to introduce modern technology in order to cope up with the development made in neighboring countries.

A New Foreign Exchange Act has been presented in the Parliament with a view to remove the prevailing deficiencies in the procedural arrears thereby paving the way for the full convertibility of the current account.

In order to facilitate settlements regarding the payment orders drawn on member's commercial bank in eleven foreign currencies viz., USD, EUR, GBP, DEM, CHF, AUD, CAD, NLG, SGD, FFR, and JPY, the foreign currency-clearing house was initiated by NRB recently.

In recent years, the country has moved significantly in the field of financial sector liberalisation. Thus a highly automated and consumer oriented modern clearinghouse, has been asked for. In this regard, a modern and fully automated clearing house, with the participation of the transacting banks, is expected to be established soon under the management of the participating banks, which will protect the consumers fully.

6. The Role of Central Bank in Ensuring the Safety and Efficiency of the Payment and Settlements Systems

The financial sector environment in Nepal has undergone significant changes in recent years. Bank and financial institutions in the country have increased tremendously not only in numbers and volume of business but also in introducing new instruments and services in the market. Similarly, use of modern means of payment system has also made financial sector more complex.

With the expansion of the banking system and the introduction of new technologies in payment and settlement system, Nepal Rastra Bank (NRB) takes more responsibility in enhancing the payment system.

In order to carry out the clearing house transactions efficiently, it is imperative that Nepal Rastra Bank computerises all the transactions. To raise the efficiency of the payment system, the number of clearing houses in the country should be increased and modernised.

To encourage economic activities in the country, it is high time that Nepal Rastra Bank engages itself in the timely monitoring of the payment system to minimise the problems incurred during settlements. In the absence of a special act, it has been difficult to efficiently conduct payment and settlement activities in the country. Thus, the NRB should come forward with a separate act for efficiently operating the payment and settlement system.

Country Tables

Table 1. Major event affecting the payment and settlement systems in Nepal

Date	Major Development
1937	Establishment of First Commercial Bank.
1955	Establishment of Central Bank.
1968	Opening of the NRB Clearing House.
1977	Recognition the Negotiable Instrument Act.
2000	Opening of the NRB Foreign Exchange Inter Bank Clearing house

Table 2. Selected Country Indicators

	1995	1996	1997	1998	1999
Population (millions persons): Year end	20.05	20.53	21.33	21.84	22.36
GDP (million Rs)	219175	248913	280513	266547	334723
GDP per capita (Million Rs)	11170	11950	13151	13775	15298
Exchange Rate (against USD)					
Year end	56.25	57.3	63.6	68	69.05
Average	56	57.03	63.3	67.68	68.73

Source: Annual Reports, Nepal Rastra Bank

Table 3. Settlement media used by non-banks (at year end) (in Rs million)

	1995	1996	1997	1998	1999
Notes and coin	22493.6	25046.4	27333.7	30893.2	34984.3
Transferable deposit	n.a	n.a	n.a	n.a	n.a
Narrow money sup.(M1)	32985.4	36498	38460.3	45163.8	51062.5
Memorandum item:					
Broad money supply (M2)	80984.7	92652.2	103720.6	126462.6	152800.2

Source: Nepal Rastra Bank

Table 4. Settlement media used by banks (in Rs million)

	1995	1996	1997	1998	1999
Reserve balances held at central bank	7429.1	6494.9	8757	14103.2	13912.9
Of which:					
Required reserves	4712.4	5482.6	6274.5	6991.2	8719.9
Free reserves	2716.7	1012.3	2482.5	7112	5193
Transferable deposits	34395.3	39135.9	42616.7	65195.6	67863.8
Memorandum item:					
Institution borrowing from central bank	454	230.5	326.6	381.4	429.5

Source: Nepal Rastra Bank

Table 5. Institutional Framework (1999)

Categories	Number of institutions	Number of branches	Number of accounts	Value of accounts
Central Bank	1	9	n.a	15284.2
Commercial:	13	487	n.a	127188.1
Public	5	427	n.a	81782.8
Private	-	-	-	-
Foreign (Joint Venture)	8	60	n.a	45405.3
Development and investment banks: *Public* *Private* *Foreign*	7	2	n.a	1663.8
Special Finance houses	45	23	n.a	8036.6
Money Exchangers	50	-	-	838.9
Post Office	1	116	n.a	"Neg"

Table 6. Cash dispensers, ATMs and EFTPOS terminals

	1995	1996	1997	1998*	1999
Cash dispensers and ATMs:					
Number of networks (year-end)					
Number of Machines (unit)	1	1	1	1	4
Volume of transactions (thousand)	11.5	19.2	22.8	30.6	32.3
Value of transactions (million)	21.6	37.6	44.9	174.7	186.2
EFTPOS:					
Number of networks (year-end)					
Number of Machines (year-end)	n.a	n.a	n.a	n.a	n.a
Volume of transactions (during)					

Source: Respective Commercial Banks

Table 7. Number of payment cards in circulation (at year-end, in thousands

	1995	1996	1997	1998	1999
Cards with a cash function	1.0	2.5	4.4	6.1	7.9
Cards with a debit/credit function					
Of which					
Cards with debit function					
Cards with credit function	1.0	2.5	4.4	6.1	7.9
Cards with a cheque guarantee function	n.a	n.a	n.a	n.a	n.a
Memorandum item:					
Retailer cards					

Source: Respective Commercial Banks

Table 8. Payment instructions handled by selected payment systems: volume of transactions (in Thousands)

	1995	1996	1997	1998	1999
International Clearing System *Cheques* *Credit transfer*					
Giro System	n.a	n.a	n.a	n.a	n.a
Interbank Clearing House (thousand)	183.1	201.7	219.8	242.7	274.5
Post Office: *Postal money orders* *Postal cheques*					

Source: Annual Reports, Nepal Rastra Bank

Table 9. Payment instructions handled by selected payment systems: value of transactions

	1995	1996	1997	1998	1999
Interbank Clearing System *Cheques* *Credit transfer*					
Giro System					
Interbank Clearing House (millions)	92129	104364	106360	129590	156570
Post Office: *Postal money orders* *Postal cheques*	"Neg"	"Neg"	"Neg"	"Neg"	"Neg"

Source: Annual Reports, Nepal Rastra Bank

Table 10. Indicator of use of various cashless payment instruments: volume of transactions (thousands)

	1995	1996	1997	1998	1999
Cheques cleared					
Payments by cards *Credit cards* *Debit cards*	n.a	n.a	n.a	n.a	n.a
Paperless credit transfers	-	-	-	-	-
Postal money orders	"Neg"	"Neg"	"Neg"	"Neg"	"Neg"
Postal cheques					

Source: Annual Reports, Nepal Rastra Bank

Table 11. Indicator of use of various cashless payment instruments: value of transactions

	1995	1996	1997	1998	1999
Cheques issued					
Payments by cards *Credit cards* *Debit cards*	21.6	37.6	44.9	92.2	207.8
Paperless credit transfers					
Postal money orders					
Postal cheques					

Source: Annual Reports, Nepal Rastra Bank

Table 12. Transfer instructions handled by securities settlement systems: volume of transactions (in thousand)

	1995	1996	1997	1998	1999
Stock Exchange	3121.4	2696.9	9966.4	1984.6	1377
Government Bond	n.a	n.a	n.a	n.a	n.a
Treasury Bills	n.a	n.a	n.a	n.a	n.a

Source: Nepal Stock Exchange

Table 13. Transfer instructions handled by securities settlement systems: valued of transactions

	1995	1996	1997	1998	1999
Stock Exchange	712.95	915.06	290.75	291.16	311.9
Government Bond	210	248.8	793.2	1245.8	1483.6
Treasury Bills	6392.5	7142.5	8092.5	9182.5	17586.9

Source: Annual reports, Nepal Rastra Bank and Nepal Stock Exchange

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Chapter 7

THE PAYMENT AND SETTLEMENT SYSTEMS IN THE PHILIPPINES

by

Magno L. Torreja Jr.*

1. Introduction

1.1 The Birth of the Central Bank of the Philippines

In 1933, the concept of establishing a central bank in the Philippines was conceived by Miguel Cuaderno.[1] The formal preparation for the organisation of a central bank started in 1946 upon the instruction of President Manuel Roxas. It was also during this year that the joint Philippine-American Finance Commission was created to study the Philippine currency and banking system, which later recommended the reform of the monetary system, the formation of a central bank, and the regulation of money and credit supply. In August 1947, a Central Bank Council was formed to review the report of the Commission and to prepare the necessary legislation for its implementation. A year after, President Roxas submitted to Congress a bill "establishing the Central Bank of the Philippines, defining its powers on the administration of the monetary and banking system, amending the pertinent provisions of the Administrative Code with respect to the currency and the Bureau of Banking, and for other purposes." This bill was Republic Act (RA) No. 265, also known as The Central Bank Act. On June 15, 1948, President Elpidio Quirino signed the Charter of the Central Bank into law. However, it was only on January 3, 1949 that the Philippine Central Bank was inaugurated and formally opened.

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1. In 1900, the First Philippine Commission passed Act No. 52 which placed all banks under the Bureau of Treasury and authorised the Insular Treasurer to supervise and examine banks and banking activities. In February 1929, the supervision was taken over by the Bureau of Banking, which was under the Department of Finance and headed by the Bank Commissioner.

1.2 Mandates and Thrusts of the Central Bank of the Philippines

The House of Representatives and the Senate passed Republic Act (RA) No. 7653, a consolidation of House Bill No. 7037 and Senate Bill No. 1235, on June 10, 1993. Under Section 3 of this Act, also known as the New Central Bank Act, the Bangko Sentral Ng Pilipinas (BSP) shall provide policy directions in the areas of money, banking and credit. It shall have supervision over the operations of banks and exercise such regulatory powers over the operations of finance companies and non-bank financial institutions performing quasi-banking functions and institutions performing similar functions. It shall also establish facilities for payment services such as interbank clearing under such rules and regulations as the Monetary Board may prescribe. The primary objective of the BSP is to maintain price stability conducive to a balanced and sustainable growth of the economy. It shall also promote and maintain monetary stability and the convertibility of the peso.

1.3 The Philippine Financial System

The Philippine financial system consists of banks and non-bank financial intermediaries. Banks, which are the main provider of payment services, include all financial institutions engaged in the lending of funds obtained from public primarily through the receipt of deposits of any kind. [2] Non-banks which are considered financial institutions are supervised and regulated by BSP in discharging their principal functions - lending, investing or placement of funds or evidence of indebtedness or equity deposited with or otherwise acquired by them, either for their own account or for the account of others. Other laws related to the banking industry include:[3] The

2. As of December 31, 1999, there were 52 commercial banks, with 4,274 branches/offices. Commercial banks are organised primarily to accept drafts and to issue letters of credit; discount and negotiate promissory notes, drafts, bills of exchange and other evidences of indebtedness; receive deposits; buy and sell foreign exchange; and lend money on a secured or unsecured basis. Expanded commercial banks, otherwise known as universal banks, are banks that have authority, in addition to commercial banking powers, to exercise the powers of investment houses, invest in the equity of companies engaged in businesses not related to banking and own up to 100% of the equity of financial allied undertakings other than commercial banks.

3. In addition to the foregoing banking institutions, as of end 1999, there were 65 investment houses, 52 finance companies, 22 security dealers/brokers, 8,566 pawnshops, 11 investment companies, 13 lending investors, 171 non-stock savings and loan associations, 8 venture capital corp., 6 mutual building and loan associations and 2 government non-bank financial institutions that are regulated or supervised by BSP.

Act Liberalising the Entry and Scope of Operations of Foreign Banks, The Thrift Banks Act of 1995,[4] Rural Banks Act of 1992.[5] Specialised government banks, on the other hand, were created under and governed by their respective charters.[6]

Under RA No. 7354, the Philippine Postal Corporation is authorised to issue domestic and international money orders. These are instruments issued to facilitate transfer of money from one person to another via a local Post Office.[7]

There are at least ten major credit cards issued in the Philippines. All credit cards in the Philippines have affiliations with major international credit cards such as Visa, Mastercard, Diner's and JCB. Some domestic and international cards have access to bank's ATM network in the Philippines. Several stores/retailers issue cards for use in their own chains, among them are Rustan's Department Store and Supermarket, SM Department Store and Landmark Department Store.

4. Thrift banks primarily accumulate the savings of depositors and invest them, together with their capital, in secured or unsecured loans, or in financing for home building and home development; in readily marketable debt securities; in commercial paper and accounts receivable, drafts, bills of exchange, acceptances or notes arising out of commercial transactions. It also provides short-term working capital and medium-and long-term financing to businesses engaged in agriculture, services, industry, housing and other financial and allied services for its chosen market and constituencies, especially for small and medium-sized enterprises and individuals. There are three types of thrift banks, namely: a) Savings and Mortgage Banks, b) Private Development Banks, and Stock Savings and Loan Associations. Thrift Banks totaled 118, with 1,360 branches/offices nationwide as of end-1999.

5. Rural banks are organised primarily to make credit available and readily accessible in the rural areas on reasonable terms. Loans and advances extended by rural banks are primarily for the purpose of meeting the normal credit needs of farmers and fishermen, as well as of cooperatives and merchants. As of end-1999, there were 806 rural banks with 1079 branches/offices all over the country.

6. Specialised government banks, which are organized to serve a particular purpose, are as follows: the Development Bank of the Philippines, the Land Bank of the Philippines and the Al-Amanah Islamic Investment Bank of the Philippines.

7. Any mailing patron can buy money order checks from their local post office, which may be drawn payable to another person or to the person making such application, if he so desires. Money order checks are then transmitted to the beneficiary either through registered letter or speed airmail. Upon receipt, domestic money orders may be presented for payment at the designated paying office, issuing office or authorised commercial bank within 90 days from date of issue. For services rendered, fees are collected by the issuing post office based on the aggregate or total amount applied for.

The BSP, with the cooperation of the Bankers Association of the Philippines (BAP) established the Philippine Clearing House Corporation (PCHC) for the net settlement of funds. PCHC was formally established on March 10, 1977 by the Bankers Association of the Philippines (BAP) as a private corporation, with a Board of Directors comprising of members drawn from selected participating banks and institutions represented by their bank presidents and senior officers. [8]

The Bureau of Treasury (BTr) assumed the last component of the fiscal agency responsibilities of the BSP on November 4, 1996. BTr established its own system that can officially register the ownership and its variants of scripless/uncertified government securities (GS) from the time of origination to redemption. This system was adopted primarily to ensure transparency in the GS market, and sustain investors' confidence in the integrity and efficiency of the same market.

2. Existing Payment and Settlement Systems

2.1 Domestic Payment and Settlement Systems

2.1.1 General Overview

Payments clearing system in the Philippines particularly in Metro Manila and nearby areas (within a 150-km radius from Manila) is the responsibility of the PCHC[9] in coordination with the BSP for the net settlement

8. The corporate goal of the PCHC is to serve the banking community in accordance with the primary purpose of providing, maintaining and rendering effective, efficient, economical and sound exchange practices and promoting faster exchange of values between clearing participants.

9. The primary objective of PCHC is to conduct automated cheque clearing operations. Other objectives of the PCHC Clearing Operations include the following: a) to effect, at a designated place, the daily exchanges between clearing participants of fully Magnetic Ink Character Recognition (MICR)-encoded cheques and other properly encoded demands; b) to provide reports to the BSP Accounting Department to serve as the basis for the settlement of exchanges; c) to furnish clearing participants with information which will enable them to balance, identify and trace items processed through the clearing operation; and, d) to assist the banking and financial community in the development, design and installation of sound exchange practices intended to promote faster exchange of values between clearing participants. The PCHC also handles the processing of Peso-US Dollar (thru the electronic Peso netting system) as well as peso interbank transactions (thru the electronic Multitransaction Interbank Payment System).

of funds. The deposit reserves maintained by the banks with the BSP serves as basis for the clearing of checks and the settlement of interbank balances relative to banks' deposit reserves with the BSP. The BSP also provides payment and clearing services through the BSP's Regional Clearing Units (RCU) throughout the country. These RCUs are completely controlled by BSP, which charges administrative and other fees for the maintenance of the clearing facilities. These RCUs operates under the rules, regulations and procedures prescribed by the BSP.

The BAP in coordination with BSP and the PCHC conceived and developed Multi-transaction Interbank Payment System (MIPS). MIPS is a delivery system, which replaces the previous paper-based instructions, with secure, and electronically transmitted instructions. Large value interbank transactions and bank transfers are cleared through MIPS. These include overnight interbank lending/ borrowing as well as bank-to-bank transfers. Payment instructions no longer pass through the clearing house but are instead directly debited against local banks' demand deposit accounts maintained with BSP. MIPS was adopted for the settlement of interbank loan transactions in October 1995. [10]

With the transfer of the fiscal agency functions from the BSP to the Department of Finance (DoF), the BTr has taken the function of booking securities through the Registry of Scripless Securities (ROSS)[11] effective November 4, 1996. ROSS is the official Registry of Scripless Securities maintained and administered by the BTr. All government securities floated/ originated by the National Government under its scripless policy shall be recorded in the registry in the name of the Government Securities Eligible Dealer (GSED) by virtue of the auction award made by the Auction Committee. Subsequent transfer of ownership or encumbrance on the scripless securities out of the Securities Account of a GSED shall be recorded in ROSS into the Securities Account of the counterparty GSED. Unsettled Government Securities floated since November 20, 1995 are registered in

10. MIPS was enhanced to MIPS2 in March 2001. Please refer to Annex 2 for the features, operations, and other relevant information about MIPS2.

11. The objectives of the ROSS are as follows: a) registration of ownership and transfers or encumbrances of scripless/uncertified Treasury bills and Treasury bonds, b) all Philippine Government Securities trade on Delivery-versus-Payment (DvP) and on Real-Time-Gross Settlement (RTGS) basis, c) elimination of potential systemic risk/disruption of the Philippine financial system, and c) lower cost of delivery/ settlement through electronic trading.

ROSS. A complete backroom processing and information system was set up in the offices of the BTr. [12]

Acquisition of securities in the secondary market is recorded in the same manner. A GSED likewise maintains Securities Sub-accounts in the name of its respective clients for the purpose of segregating scripless government securities sold to clients in the secondary and tertiary markets under one account, provided that the GSED maintains complete records of ownership/other titles of their clients in the GSED's own books. GSEDs desiring to achieve Delivery-Versus-Payment (DvP) and Real-Time-Gross-Settlement (RTGS) in their secondary market transactions shall open a Settlement Account with the BSP or any bank of their choice, which, like the BSP, shall agree to service their settlement of scripless securities trade immediately upon notice of a transaction concluded. All banks/financial institutions, which maintain regular demand deposit accounts with BSP, may act as settlement banks in connection with the government securities trade transactions of ROSS account owners.

Settlement of US$ transactions in the Philippine Dealing System (PDS)[13] is done via the Philippine Domestic Dollar Transfer System

12. The BSP-Government Securities Department (BSP-GSD) used to maintain the Book Entry System (BES) in which transfers from one account to another are effected. However, with the transfer of the fiscal functions from the BSP to the DoF, the BTr has taken the function of booking securities through the ROSS effective November 4, 1996. The DoF decided to issue uncertified government securities after months of study by the BTr on how to make Philippine Treasury bills/bonds globally competitive in form, efficiency and safety. The advantages of efficiency and safety also included cost-savings for the government. It also eliminated the risk of the certificate falling into the hands of thieves and unscrupulous persons, its endorsement being forged and double encashment or the like.

13. For Philippine peso/US dollar trading, interbank transactions are done mainly through the PDS. However, member bank of the PDS can directly deal through the broker using the telephone or other electronic system (i.e. Reuters Dealing). To capture the deal through brokers, the two PDS member banks must confirm their deals through the PDS. The PDS is an electronic on-line trading system developed by the Bankers Association of the Philippines (BAP) in coordination with the BSP, as a response to the growing need to liberalise and modernise all market transactions. The PDS has been in place since 1992 and is supported by Telerate. The current PDS "captures" Philippine peso/US dollar transactions for value same day, tomorrow and spot. The auto capture function of the system makes it easy for all the member banks to monitor the real time weighted average rate of the peso and total volume of transactions at any particular time of the day. Trading at the PDS starts at 9:00 AM and ends at 4:00 PM.

(PDDTS). The PDDTS is a local clearing and electronic communications system operated by the BAP, the PCHC and Citibank, Manila. It provides the banking industry with a facility to move US dollar funds from one Philippine bank to another on the same day, without having to go through correspondent banks in the U.S. This system replaces the FX Clearing and Settlement System, which was primarily designed to handle OCW remittances.

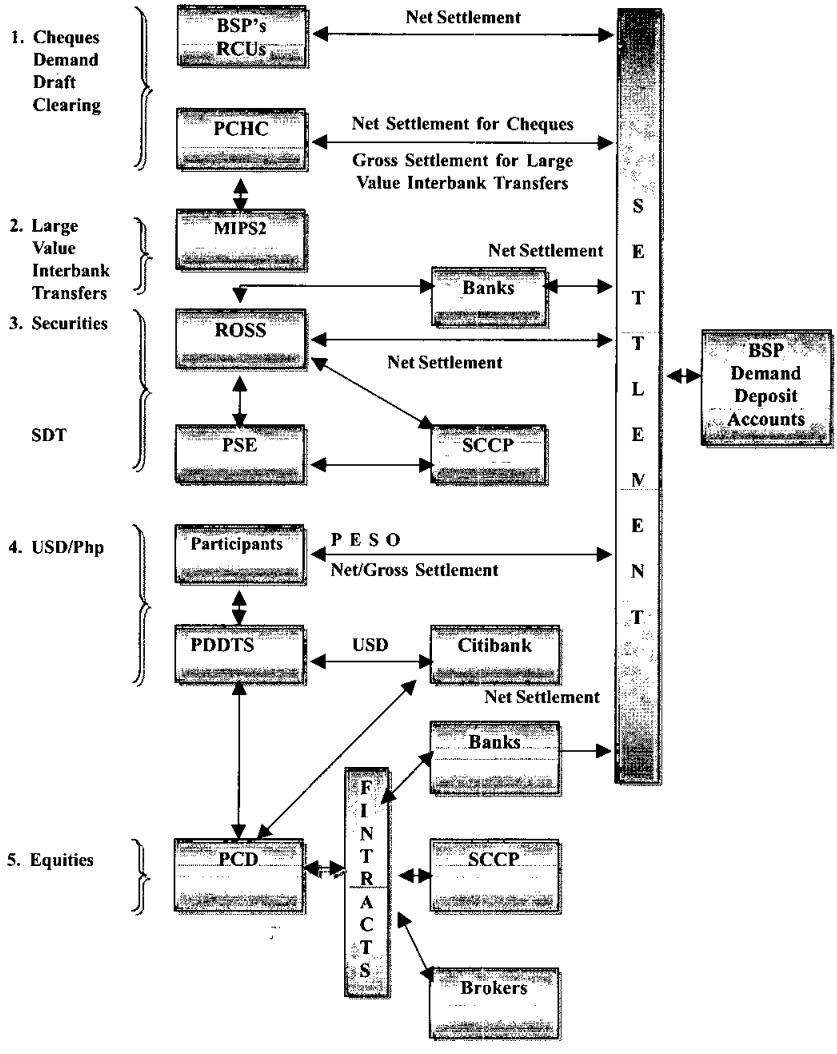
The Philippine Central Depository (PCD) was incorporated on March 31, 1995 to improve operations in securities transactions. It seeks to provide a fast, safe and highly efficient system for securities settlement. PCD uses the BES to record ownership of shares. Movement of shares is effected via electronic debit and credit of holdings. Through immobilisation, BES reduces the physical movement of stock certificates (scrip). It also discourages fraud attributable to forgery and theft, as well as eliminates inconveniences due to lost certificates. Scripless trading, a system where settlement is carried out via BES, makes investment easier, cheaper and safer.

The payment and settlement systems in the Philippines are presented in Figure 1 at the next page.

2.1.2 Payment Methods

In the Philippines, payment instruments may be classified into cash or non-cash. Cash is generally paper-based while the non-cash instruments are either paper-based or electronic-based. Non-cash payment instruments may be sub-classified generically into cheque payments, direct fund-transfers and card payments.

Figure 1. Payment and Settlement Systems in the Philippines



The penetration of payment instruments for the period 1995 to 1999 are shown below.

Penetration of Payment Instruments

Payment Instrument/1	1995	1996	1997	1998	1999
Cash/2 (In Million Pesos)	110,892	122,954	143,643	146,065	218,474
Value of Cheques Cleared (In Mio USD)/3	n.a.	18,539	n.a.	n.a.	18,990
Value of Credit Card/3 (In Mio USD)/3	n.a.	314	n.a.	n.a.	430
Value of Debit Card (In Mio USD)/3	n.a.	410	n.a.	n.a.	562
Direct Credit Transfers/4 (In Mio Pesos)	9,016	18,660	65,698	71,540	147,736
Direct Debit Transfers/4 (In Mio Pesos)	n.a.	n.a.	1,651	1,776.68	3,630.16

/1 Figures for other payment instruments are not available.
/2 Figures are the currency in circulation as reported by BSP.
/3 Figures taken from the Asian Banker Journal Issue 21, converted into Peso using the average exchange rate of USD/Php for the year. Figures from 1995 to 1998 were computed based on the average growth rate of 20% as reported by Mr. B.M. Ovenson.[14]
/4 Figures are the demand deposits as reported by BSP.

In real terms, the penetration of payment instruments per labour force from 1995 to 1999 are displayed in the table below.

Penetration of Payment Instrument per labour Force (In Tens USD)

	1995	1996	1997	1998	1999
Cash	151.95	157.74	160.58	115.02	174.22
Cheques	n.a.	623.52	n.a.	n.a.	591.94
Credit Cards	n.a.	10.56	n.a.	n.a.	13.40
Debit Card	n.a.	13.79	n.a.	n.a.	17.52
Direct Credit Transfers	12.35	23.94	73.44	56.34	117.81
Direct Debit Transfers	n.a.	n.a.	1.85	1.40	2.89

The percentage share of payment instrument per labour force from 1995 to 1999 are exhibited in the following table.

14. Mr. B.M. Ovenson, Regional Manager for the Sino-Asia Region, VeriFone, Hewlett Packard, i.t.matters, "RP A 'Good Market' for Smart Cards," Business World Internet Edition, Manila, Philippines, Wednesday, November 24, 1999.

Percentage Share of Payment Instruments Per Labour Force

	1995	1996	1997	1998	1999
Cash	92.48%	19.02%	68.08%	66.58%	18.98%
Cheques	n.a.	75.16%	n.a.	n.a.	64.50%
Credit Cards	n.a.	1.27%	n.a.	n.a.	1.46%
Debit Card	n.a.	1.66%	n.a.	n.a.	1.91%
Direct Credit Transfers	7.52%	2.89%	31.14%	32.61%	12.84%
Direct Debit Transfers	n.a.	n.a.	0.78%	0.81%	0.32%

2.1.2.1 General Observations

The use of cash for payments indicates that currency still plays an important role as retail payment instrument for face-to-face payments in the country. Cash payments account about 19% of the total payments made in 1999, slightly lower by 0.02% from the 1996 levels as shown in the table above. This indicates that the popularity of cash for payments in the country has decreased slightly since 1996.

Cheque remains as the most widely used instrument for payments in the country in spite of the availability of electronic payment means in the market as indicated in the preceding tables. Moreover, the proportion of demand deposits to narrow money supply (M1) rose to 45% in 1999 from the 40% in 1995 (Chart 13). By year 1999, the spread of payment instrument-to-GDP ratios between currency in circulation and demand deposit narrowed to 1.4% from 1.9% in 1995 (Chart 14). This would indicate an increase in the demand deposits transactions. Similarly, the volume of cheques cleared in the Philippine Interbank Clearing System registered 14.18% growth from 101.78 million in 1995 to 116.21 million in 1999 (Chart 9) while the "bankable"[15] population grew by 13% in 1999 from the 28.4 million in 1995 (Chart 7). This indicates a growing acceptance

15. Bankable population: working population aged 18 or over with income exceeding USD5,000 annually. Note: The data used in this paper are the total labor force regardless of annual income.

and usage of cheques as payment instrument. The trend could mean also that Filipinos now find it more convenient and safe to use cheques than cash in paying their bills. The danger of carrying cash for regular payments could be one of the factors that may have contributed to this behaviour. Moreover, it could also mean an increase in confidence or trust in the usage of cheques as a payment instrument as well as increase in confidence on the system handling the payments and settlements for cheques. Negret et. al., pointed out that a number of factors are commonly known for their significant influences on the success of these payment systems.[16] Among these factors are the following: certainty, reliability, safety, security, and convenience. Overall, the popularity of cheque payments as a percentage share in total payments has decreased to 65% in 1999 from 75% in 1996 as reflected in the table.

The credit and debit cards are still a relatively underdeveloped industry in the country despite its growth at an average of 20% year-on-year from 1995 to 1999 with an estimated number of cardholders at about three million credit cards and 12 million debit cards while being supported by about 30 thousand card-accepting merchants.[17] The credit and debit cards payments as a percentage share of the total payments have increased to 1.46% and 1.91% in 1999 from 1.27% and 1.66% in 1996, respectively, as shown in the preceding tables. This would indicate that the Philippines is moving slightly to a cash-less society.

Moreover, the volume of credit transfers for USD/Php transactions cleared in the Philippine Interbank Clearing System rose to 479 thousands in 1999 from 264 thousands in 1995 (Chart 10). While the value of the transactions posted a hefty increase of Php139 billion (or by 1,500 percent) from the Php9 billion in 1995 (Chart 11). Similarly, the volume of interbank transfers for IBCL increased to 168 thousands in 1999 (or by 29.23%) from 130 thousands in 1995 (Chart 10) while the value of interbank transfers for IBCL widened by Php1, 979.15 billion in 1999 (or by 120%) from Php1, 651.01 billion in 1995 (Chart 11). The significant decrease in the value of peso against the US dollar to 39.09 in 1999 from

16. Negret, F.M., Keppler R. "Project Design for Payment Systems," Public Policy for the Private Sector, The World bank, FPD Note No. 37, March 1995, pp. 2-5.

17. Mr. B.M. Ovenson, Regional Manager for the Sino-Asia Region, VeriFone, Hewlett Packard, i.t.matters, "RP A 'Good Market' for Smart Cards," Business World Internet Edition, Manila, Philippines, Wednesday, November 24, 1999.

25.71 in 1995 may explain the wide increase in the value of credit transfers for USD/Php transactions (Chart 12) while MIPS may have contributed to the tremendous growth in the volume and value of interbank call loan (IBCL) transfers.

In summary, 86% of transactions in the Philippines are still made with cash and cheques in 1999.[18] However, the popularity of cash and cheque as payment instruments, as a percentage share in the total payments, has decreased slightly since 1995. On the other hand, credit and debit card payments as well as direct credit and debit transfers, as a percentage share in the total payments, have increased significantly for the period 1996 to 1999. This would indicate that the Philippines is moving towards a cashless society. However, the velocity of circulation of money in the Philippines slowed down to 2.35 times in 1999 (or by 20.60%) from 2.96 times in 1995 (Chart 15). The velocity of circulation of money (V) in the Identity of exchange MV = PT, where M is the stock of money readily transferable [currency (c) plus demand deposits (d)], P is the price level, and T is the volume of trade or transactions in the economy, measures the ratio of a flow of payments (PT) to the stock of money that performs the payments.[19] Conceptually, velocity of circulation of money tells us the number of times the money supply must be reused to meet the transaction and payment demands of a given level of aggregate economic activity. Thus, an increase in the velocity of circulation of money would mean efficient usage of money supply in meeting the transaction and payment demand of a given level of aggregate economic activity.

2.1.2.2 Cash

In the Philippines, a large portion of payments to individuals is usually made in the form of cash, especially in the areas of retail trade, ground transportation and personal services. This may explain the wide increase of cash in circulation from Php110.9 billion in 1995 to Php218.5 billion in 1999 or 97% over the last five years as shown in Chart 1. In real terms, the currency in circulation per labour force in USD grew from USD151.95

18. The presence of the figures coming from the other payment instruments would have added more meaning to the comparative analysis.

19. Cramer, J. S. 1987. "Velocity of Circulation", The New Palgrave: A Dictionary of Economics, Eatwell, J., M. Milgate and P. Newman, eds. New York: McMillan Press.

in 1995 to 174.22 in 1999 Chart 2. This means that the average working Filipinos now have more cash in their wallets than in 1999. The reasons for this are unclear, but the impact of the financial reforms jointly instituted by the National Government, BSP, and BAP that started in the early 1980's would be one of them. Philippines experienced economic boom in 1990 until the advent of the financial crisis in 1997. Similarly, the cash related to GDP rose slightly by 1.5% from 5.8% in 1995 (Chart 3).

Moreover, the behaviour of cash from 1995 to 1999, as measured by the currency in circulation/monetary liquidity ratio, shows a similar growth in its use (Chart 4). The existence and growth in the number of ATMs and ATMs networks in the country may have contributed to greater convenience in obtaining cash and lower costs of supplying cash at traditional banking locations. The number of ATM machines grew from 2,089 in 1995 to 3,483 in 1999 (Chart 5). Understandably, the density ATM machine and bank per labour force have decreased significantly as shown in Chart 6. Cash is usually dispensed over bank counters or network of ATMs.

2.1.2.3 Cheques

The demand deposits in the country widened by 137% from Php74.04 billion in 1995 to Php175.65 billion in 1999 (Chart 7). Similarly, the "bankable"[20] population in the country reached 32.1 million in 1999 (Chart 7). This represents an increase of 3.7 million or 13% from 28.4 million in 1995. However, these "bankable" populations as a percentage of the total population posted a slight growth of 1.39% only (Chart 8) from the 40.39 percent in 1995. This could explain the registered increase of 14.18% in the volume of cheques cleared in the Philippine Interbank Clearing System from 101.78 million in 1995 to 116.21 million in 1999, (Chart 9). In absolute terms, the value of cheques cleared in the PCHC increase to USD18.99 billion (or by 2.43%) in 1999 from USD18.539 billion in 1996.[21] This would indicate a growing acceptance and usage of cheques as payment instrument as well as an increase in confidence or trust in cheque payments.

20. Bankable population: working population aged 18 or over with income exceeding USD5, 000 annually. Note: The data used in this paper are the total labour force regardless of annual income.

21. "The Playing Field for Payment Instruments," The Asian Banker, Special Report, Issue 21, March 2000.

2.1.2.4 Credit and Debit Card

The credit/debit card industry in the Philippines has grown at an average of 20% year after year from 1995 to 1999 as reported by Mr. Ovenson.[22] He added that as of November 24, 1999, there are about three million credit cards and 12 million debit card users in the country while being supported by about 30 thousand card-accepting merchants. Similarly, the Asian Banker Journal[23] reported that the number of credit cards rose by 94% from 1996 to 1999 while the volume of turnover increased to USD430 million in 1999 (or by 36.93%) from USD314 million in 1996. Moreover, it also reported that the value of debit card transactions in 1999 of USD562 million were USD152 million more than its level in 1996.

2.1.2.5 Direct Funds Transfers

The Philippine Interbank Clearing System cleared about 479 thousands credit transfers for USD/Php transactions in 1999. This was higher compared to 264 thousands in 1995 (Chart 10). Understandably, the value of the transactions posted a hefty increase of 1,500% from Php9 billion in 1995 (Chart 11) to Php139 billion in 1999. Similarly, the volume of interbank transfers for IBCL increased to 168 thousands in 1999 (or by 29.23%) from 130 thousands in 1995 (Chart 10). Moreover, the value of interbank transfers for IBCL recorded tremendous growth of Php1, 979.15 billion in 1999 (or by 120%) from Php1, 651.01 billion in 1995 (Chart 11). The devaluation of peso against US Dollar from 25.71 in 1995 to 39.09 in 1999 may explain the wide increase in the value of credit transfer for USD/Php transactions (Chart 12) while MIPS may have contributed to the wide increase in the volume and value of interbank transfer for IBCL.

2.1.2.6 Other Payment Instruments

There are also other forms of payment instruments that are widely used in the Philippines such as money orders, wire transfers, travellers' cheques, pre-authorised debit-bill cards, EFTPOS debit cards, cards with credit and debit card features, credit cards which can be used for cross-border trans-

22. Mr. B.M. Ovenson, Regional Manager for the Sino-Asia Region, VeriFone, Hewlett Packard, i.t.matters, "RP A 'Good Market' for Smart Cards," Business World Internet Edition, Manila, Philippines, Wednesday, November 24, 1999.

23. "The Playing Field for Payment Instruments," The Asian Banker, Special Report, Issue 21, March 2000.

actions, pre-paid cards, and smart cards.[24] However, the data for the volume and value of transactions for these payment instruments are not available.

2.1.3 Structure, Operation and Administration

2.1.3.1 PCHC Payment and Settlement System

a. Participants

Banks (stockholders/members), financial institutions (associate members) and BSP are all participants in the fully Magnetic Ink Character Recognition (MICR) clearing operations (please refer to Figure 2 for the diagram of the PCHC flow of operations). There are two classes of participants, namely:

- **Direct participants** - composed of stockholder member (commercial bank), non-commercial bank that has met the required Php1.25 Bio capital structure, affiliates/subsidiaries of stockholder participants, which have been provided a standby letter of credit (LC) by the mother institution.
- **Indirect participants** - composed of non-stockholder-members, which have conduit arrangements with stockholder-members, presently considered as direct participants but will revert to indirect participants status if they do not meet the required capital structure equivalent to that of a commercial bank and/or if they fail to subscribe to the capital stock requirement of PCHC for direct participants by year 2000.

b. Types of Transactions

Only cheques that are drawn against Metro Manila and nearby areas with fully MICR-encoded and other properly encoded demands are cleared through PCHC.

c. How the System Operates

Each clearing participant, through his representative, shall deliver to the PCHC fully qualified MICR cheques grouped in batches composed of

24. Please refer to section 4.3 for the recent initiatives of local private companies on smart cards.

a maximum of two hundred checks per batch supported by an "addlist", a batch control slip and a delivery statement. Each participant procures their supply of batch control slips from BAP-accredited security printers with the clearing participant's name and BASTN preprinted thereon.

Discrepancies between the PCHC computer-generated total and the presenting banks' Batch Control Slip amount arising from exception conditions such as missing items, free items, erroneous bank's add-list, etc., shall be reconciled by PCHC by passing adjustment tickets to balance the batch totals. The reconciled and adjusted amount shall be used to credit the bank's clearing account.

Any cheque/item sent for clearing through the PCHC on which payment is refused by the drawee bank, in accordance with long standing and accepted banking practices, shall be returned through the PCHC not later than the next regular clearing for local exchanges. The acceptance of the returned cheque/item by the presenting (collecting) bank is mandatory. Each returned item shall be presented to the Clearing House via the use of MICR Document Carrier Envelopes. These will be processed by the PCHC as a separate job and will not be intermingled with bundles of regular clearing items. Return of such items through the Clearing House Facility after the "reglementary period" shall be subject to penalty.

Items which have been subject to a material alteration or items bearing a forged endorsement when such endorsement is necessary for negotiation shall be returned by direct presentation or demand to the presenting (collecting) bank and not through the regular clearing house facilities within the period prescribed by law for the filing of a legal action by the returning bank/institution against the institution/entity sending the same.

Items originally presented and subsequently returned by the drawee bank may be subject again to clearing for the last and final time. Any subsequent submission and return of the cheque after the second presentation shall be subject to a penalty of 1/8th of 1% of the amount of the item or P1, 000.00, whichever is higher, to be imposed by the drawee bank against the presenting bank. However, reclearing of an item previously returned or dishonoured for reasons of stop payment order or the account is closed is strictly prohibited.

Special clearing of cheques by direct presentation shall be allowed only for regular clearing items or returned items not presented at the PCHC Clearing Window on or before the clearing cut-off time which are as follows:

- **Regular clearing items** to be delivered to the drawee bank's Central Clearing unit not later than 8:00 p.m. of the same day; and
- **Returned items** to be delivered to the presenting bank's Central Clearing Unit not later than 10:00 p.m. of the same day. However, there is nothing to prevent the returning/drawee bank to deliver the returned item directly to the presenting branch.

A Special Clearing Receipt shall be used for regular clearing cheques and returned items presented directly to the drawee bank.

Regular clearing cheques/items when presented directly to the drawee bank shall be treated as if they were received from normal clearing operations. Accordingly, they shall be subject to return within the 24-hour "reglementary clearing rule" counting from the clearing time on the date of receipt.

d. Volume of Transactions Handled

The following are the volume of cheques and credit transfer-Php/USD transactions handled by the Philippine interbank clearing system as well as by the interbank clearing house, viz:

Year	Volume of Cheques (In Millions)	Volume of Php/USD (In Millions)	Volume Interbank Clearing House (In Millions)
1995	101.782	0.264	-
1996	111.975	0.312	-
1997	116.713	0.377	0.130
1998	112.838	0.453	0.120
1999	116.210	0.479	0.168

Source: PCHC thru the effort of Mr. Bobier and Mrs. Cruz.[25]

25. Mr. Eduardo G. Bobier, Bank Officer IV and Mrs. Lagrimas G. Cruz, Manager II are both from the FX/OMO Group of the Treasury Department, Bangko Sentral Ng Pipilinas.

e. Settlement Procedures

Clearing balances of participating banks/branches shall be debited or credited, as the case may be, to the clearing accounts of banks respective head offices in the BSP in the afternoon of the same day the demands are presented for clearing.

Any bank which incurs an overdraft in its deposit account with the BSP shall fully cover said overdraft, including interest at a rate equivalent to one-tenth of one percent (1/10th of 1%) per day or the prevailing 91-day T-bill rate plus three percent points, whichever is higher, not later than the next clearing day. The appropriate clearing office (PCHC and the BSP Regional Clearing Office) shall officially notify banks with overdrawn balances.

Settlement of clearing balances with the BSP shall not be effected for any account which continues to be overdrawn for five consecutive banking days until such time that the overdrawn amount is fully covered or otherwise converted into an emergency loan or advances pursuant to the provisions of Section 84 of R.A. No. 7653. Banks may also borrow from other banks through the interbank facility or from the BSP through the overnight or term regular repurchase facilities at existing rates to cover overdrafts.

f. Pricing Policies

Pricing policies for the services of PCHC to its member clients are based on the daily number of items for each branch with a minimum payment of Php1, 000.

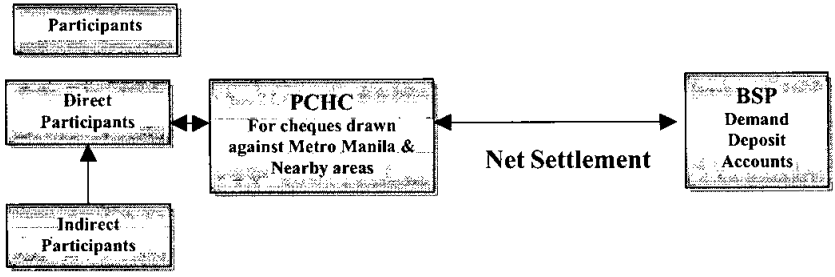
g. Management of Risk

The system permits overdraft and deferral of settlement in the clearing balances of the participating banks/branches with the BSP which may pose credit and liquidity risks. However, the following measures have been taken by the BSP to address the risks posed by the present system:

- Settlement of clearing balances with the BSP shall not be effected for any account, which continues to be overdrawn for five consecutive banking days until such time that the overdrawn amount is fully covered.
- Conversion of the overdraft into an emergency loan or advances pursuant to the provisions of Section 84 of R.A. No. 7653.

- Banks may borrow from other banks through the interbank facility or from BSP through the overnight or term regular repurchase facilities at existing rates to cover overdrafts.

Figure 2. Cheque Clearing
Drawn against Metro Manila & Nearby Areas



2.1.3.2 BSP'S RCUs Payment and Settlement System

a. Participants

All participants/members of PCHC clearing operations not covered by the geographical coverage of PCHC are participants in the BSP regional clearing operations (please refer to Figure 3 for the diagram of the BSPs-RCUs flow of operations).

b. Types of Transactions

All types of cheques and demand drafts drawn by regional and provincial branches of banks not covered by the PCHC clearing operations.

c. How the System Operates

Each clearing participant, through its representative, shall deliver his respective demands in sealed envelopes made out separately against other participants. The total of each demand shall be listed in a certified adding machine tape attached to the sealed envelope. In the acknowledgment of receipt of the demands against a participant, the settling clerk for the drawee bank prepares and signs a Clearing Office Statement in duplicate for local clearing.

The original and duplicate of the statement shall be submitted to the Regional Clearing Officer in the regional clearing centers. The original shall be retained and shall be the basis for settlement of clearing balances in the respective deposit accounts with the BSP. The duplicate, duly authenticated by the Regional Clearing Officer concerned, shall be returned to the participant concerned through their clearing representatives. The duplicate shall be the basis of each participant in taking up corresponding entries in their respective books of accounts on the date of clearing.

Demands may be presented directly to the drawee bank/branches, institution or entities at times other than that specified in Item "a". For this purpose, a Special Clearing Receipt shall be used. The original and duplicate copies of the receipt shall be retained by the sending bank/branch. At the following clearing session, the original of the Special Clearing Receipt shall be presented as a demand against the bank/branch, institution or entity concerned. However, direct settlement between parties concerned may also be effected if they so desire.

Items that should be returned for any reason whatsoever shall be sealed in special red envelopes for presentation not later than the next regular clearing schedule. These shall be considered and accounted for as debits to the demanding banks/branches and credits to the returning banks/branches.

Items which have been the subject of material alteration or items bearing a forged endorsement when such endorsement is necessary for negotiation shall be returned by direct presentation or demand to the collecting bank and not through the regular clearing facilities within the period prescribed by law for the filing of a legal action by the returning bank/branches against the bank branch sending the same.

d. Volume of Transactions Handled - Data are not available.

e. Settlement Procedures

The PCHC settlement procedures also apply for cheques and drafts drawn by regional and provincial branches of banks.

f. Pricing Policies

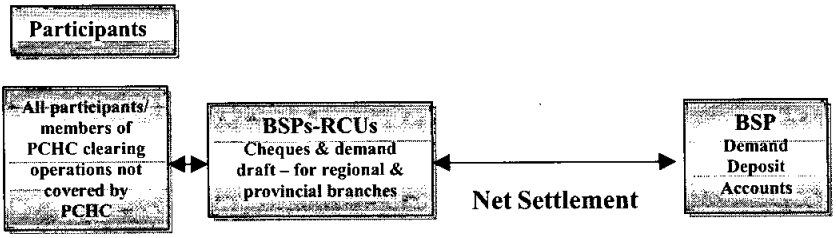
The BSP charges administrative and other fees for the maintenance of the clearing facilities. The clearing fee being charged by the BSP to clear-

ing participants are pro-rated based on the participant's number of branches.

g. Management of Risk

The measures taken by BSP to contain the risks posed in the PCHC system also apply to the BSP's RCUs.

Figure 3. Cheque Clearing
Cheques & Demand Draft Drawn in the Regional & Provincial Banks/Branches



2.1.3.3 Multi-transaction Interbank Payment System (MIPS)

a. Participants

Participating banks are classified as follows (please refer to Figure 4 for the diagram of MIPS flow of operations):

- **Direct participants** - refer to banks which initiate their own transactions, have front-end softwares and which act independently.
- **Indirect participants** - refer to those, which have conduit arrangements with direct participants (Note: Currently, there are only three institutions which are considered as investment arms of major commercial banks that fall under this category).

b. Types of Transactions

Large value interbank transactions and bank transfers are cleared through MIPS. These include overnight interbank lending/borrowing as well as bank-to-bank transfers. Due to the confidentiality of data involved, the BSP does not use MIPS for its own interbank transactions. Payment instruc-

tions no longer pass through the clearing house but are instead directly debited against local banks' demand deposit accounts with BSP.

c. How the System Operates

MIPS is a delivery system, which replaces the previous paper-based instructions with secure and electronically transmitted instructions. It is designed to cover three major areas of commercial banking applications namely: IBCL, government securities and fund transfers. The primary benefit derived from the implementation of this system is the enhancement of efficiency in managing the demand deposit accounts (DDA) of banks as information on DDA balances will become available much earlier than in the past. The secondary benefit is cost reduction, as there will be no need for messengers to shuttle from the borrowing bank to the lending bank to the BSP. The reduction of cost benefit also redounds to BSP, as the matching and authentication of each IBCL transaction, previously done manually by the BSP, will now be done electronically by the PCHC.

The IBCL System utilises existing telecommunication links between banks and the PCHC. At one end of the link are the individual banks with PC's, modems, and telephone lines. At the other end of the link is the PCHC with a server and a bank of modems to accommodate simultaneous calls from banks. Through the system, IBCL instructions are sent by both borrowing banks and lending banks to the PCHC for authentication, matching, and onward transmission to the BSP. Security measures are in place at the participating bank, at the PCHC, and at the BSP to ensure that only duly authorised transactions are processed.

Each participating bank and financial institution will use confidential login IDs and passwords and authentication keys known only to it to authorise debit and credit instructions to its Demand Deposit Account at the BSP. Authenticated instructions are deemed legally executed by the transacting parties.

As soon as the IBCL transactions are concluded, each individual bank enters the transactions into their PCs and transmits these to the PCHC. Once at the PCHC, the instructions sent by borrowers are matched with the instructions sent by the lenders to ensure that all transaction details are correct. In order to allow banks to correct erroneously entered transactions, there are three-time windows provided within the morning of the trading day where banks can send or re-send their corrected instructions. After the

third time window, the PCHC will do a final run where the transactions are matched and all matched transactions are processed to produce each individual bank's summary of activities and net debits or credits.

d. Volume of Transactions Handled

The volume and value of transactions handled by MIPS from 1997 to 1999 were as follows:

Year	Volume of Transactions (In Millions)	Value of Transactions (In Millions)
1995		
1996		
1997	0.130	1651.01
1998	0.120	1776.68
1999	0.168	3630.16

Source: PCHC thru the effort of Mr. Bobier and Mrs. Cruz

e. Settlement Procedures

A summary report of all matched IBCL Funds Transfer Instructions received and authenticated is forwarded by 1:00 p.m. by the PCHC to the BSP for settlement.

BSP is not obliged to effect the transfer of funds if there is no sufficient balance in the DDA of the borrower or lender, as the case may be, per BSP's books.

The BSP will only act upon the automated summary of IBCL Funds Transfer Instructions assigned by an authorised officer/s of the PCHC. Upon receipt, BSP will immediately post the net results of the summary of IBCL instructions received from the PCHC so that the updated abstract (DDA Statement) of each bank reflecting the entire day's transactions will be available by 2:00 p.m. on the business day immediately following the value date of the transaction.

If the borrower or lender, as the case maybe, does not have enough balances in its DDA, the BSP may not effect transfer of funds from the institution to be debited with respect to the transactions affected on a Last In, First Out basis (LIFO).

In implementing the LIFO method of unwinding inadequately funded transactions, lending instructions shall be unwound by the BSP ahead of repayment transactions through such LIFO method based on the automated summary provided by the central system to PCHC and confirmed by PCHC's authorised signers.

In case transactions have to be unwound because of the insufficiency of DDA balances of the borrower or lender with the BSP, fines and/or penalties will be imposed upon the institution to be debited, as the case may be, in accordance with a schedule to be drawn up by the PCHC and the BAP Board of Directors.

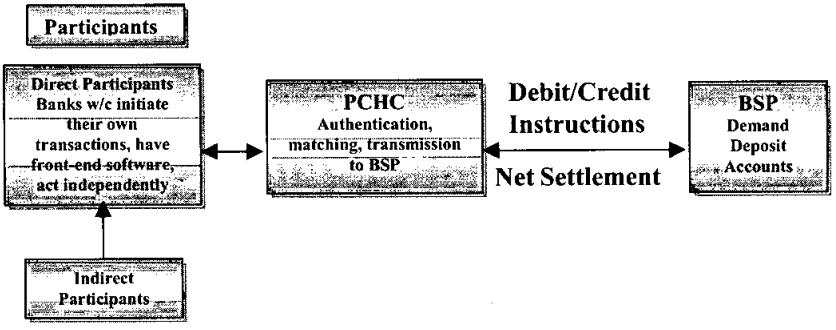
f. Pricing Policies

Transaction fees are being assessed by the PCHC against all participating banks and financial institutions on a per transaction basis subject to rules and regulations promulgated by the PCHC.

g. Management of Risk

MIPS allows unwinding of funds for inadequately funded transactions, which may trigger disruption in the flow of funds. The most serious risk in MIPS netting system is the risk of settlement problems arising from settlement failure owing to liquidity or solvency difficulties of one or more participants. In April 2001, MIPS was enhanced to MIPS2. Under MIPS2, transactions are settled gross, on a trade for trade basis and with finality subject to the availability of balances in the deposit reserves maintained by banks with the BSP thus addressing the possible threat of systemic risk arising from MIPS.

Figure 4. MIPS for Large Value Interbank Transactions and Bank Transfers



2.1.3.4 Registry of Scripless Securities (ROSS)

a. Participants in the System

The participants in the ROSS are as follows (please refer to Figure 5 for the diagram of ROSS flow of operations):

- **Government Securities Eligible Dealers (GSED)** - are dealers licensed by the Securities and Exchange Commission to engage in both purchase and sale of government securities. They are acknowledged by the BTr as eligible to participate in the auction upon application and proof of unimpaired capital of at least P100 Million, compliance with statutory ratios, and subscription of an electronic link to the BTr's Automated Debt Auction Processing System and the ROSS, and existence of a Demand Deposit Account with the BSP.
- **Non- Government Securities Eligible Dealers (Non-GSED)** – are dealers which may also engage in the purchase and sale of government securities but only from and to GSEDs. Any institution may be accepted as a non-GSED after submission of proof that they are into buying and selling of securities, application of membership to the ROSS and accomplishment of an Oath of Undertaking that they will abide by all the rules and provisions of the system.

b. Types of Transactions

The ROSS handles the transfer of ownership or encumbrance on the scripless securities out of the Securities Account of a GSED into the Securities Account of the counterparty GSED.

c. How the System Operates

Under the ROSS, GSEDs maintain a Securities account for official recording of scripless government securities awarded to them as a result of an auction. Acquisition of securities in the secondary market is recorded in the same manner.

A GSED likewise maintains Securities Sub-accounts in the name of its respective clients for the purpose of segregating scripless government securities sold to clients in the secondary and tertiary markets under one account, provided that the GSED maintains complete records of ownership/ other titles of their clients in the GSED's own books.

GSEDs desiring to achieve Delivery-Versus-Payment (DvP) and Real-Time-Gross-Settlement (RTGS) in their secondary market transactions shall open a Settlement Account with the BSP or any bank of their choice, which, like the BSP, shall agree to service their settlement of scripless securities trade immediately upon notice of a transaction concluded. All banks/financial institutions, which have regular demand deposit account with BSP, may serve as settlement banks in connection with the government securities trade transactions of ROSS account owners.

GSEDs have the option to: (1) fund their Settlement Account before the start of trading hours or 9:30 a.m., or (2) avail of an Overnight Credit Line with the Settlement Bank which shall be deemed drawn whenever the GSED's Settlement Account is negative or insufficient to settle a trade, otherwise the transaction shall be queued until sufficient funds are credited to the Settlement Account.

Before the implementation of the familiarisation period for Circular 266, trading hours starts at 9:30 AM to 12:00 Noon. However, under Cir. 266, banks can now deal with BSP as well as among themselves up to 3:00 PM. GSEDs have until 2:00 p.m. to register their transactions with ROSS. Trades conducted through electronic trading systems shall be keyed-in/transmitted by the counterparties to the BTr office of ROSS. This will give ROSS sufficient time until 4:00 p.m. within which to clear the scripless securities and settle the payment thereof.

For transactions wherein one of the parties does not have the electronic link to the ROSS System or in cases of system breakdown and failure of trade transactions to meet the cut-off time prescribed by ROSS, these are

manually settled through physical delivery of the confirmation of outright purchase with corresponding confirmation of outright sale/purchase with re-sale/etc., by the counterparties to the BTr office. Cash settlement for these transactions will now be in the form of checks.

GSEDs shall ensure that all trades are cleared and settled, having sufficient securities and cash/credit in the corresponding accounts. If for any reason, a trade is not cleared/settled, ROSS shall queue the trade until the GSED corrects the deficiency, in which event, ROSS shall clear/settle the trades queued on a first-in-first-out basis.

On the coupon payments and redemption, the BTr shall credit the Settlement Account of each GSED with the amount of coupon payments, net of tax, on coupon due date. Likewise BTr shall credit the Settlement Account of each GSED with the redemption value of the government securities on maturity date. Amounts due to the owners of a GSED's Sub-Account shall accordingly be indicated in the credit advice.

For government securities issued prior to the origination under the 20 November 1995 auction, GSEDs shall settle/clear all transactions pertaining to such securities with BSP's Book Entry System (BES) in accordance with the corresponding settlement arrangement currently being followed by GSEDs.

d. Volume of Transactions Handled

Since its launching in 1997, RoSS registered the following annual volume of transactions:

Year	Volume*/	% of Change
1997	**Php 404,545.29**	**-**
1998	**1,795,321.79**	**344%**
1999	**4,257,733.00**	**137%**

*/ System started only in 1997
Source: PCHC thru the effort of Mr. Bobier and Mrs. Cruz.

e. Settlement Procedures

Settlement of transactions may be done manually or electronically as follows:

- **Manual Settlement.** For transactions wherein one of the parties does not have the electronic link to the RoSS system or in cases of system breakdown, the buyer of securities prepares a Confirmation of Purchase (COP) while the seller prepares a corresponding Confirmation of Sale (COS) containing all the details of the transaction, i.e., the ISIN Number, issue and maturity dates, face amount, transaction number. The Btr then matches the COP with the COS. Matched transactions are then posted to individual securities accounts. Cash settlement maybe in the form of checks or direct debit against their accounts with depository banks.
- **Electronic Settlement**. For electronic settlement of transactions in the *primary market* transactions (Auction) of T-bills/T-bonds, the Bureau of Treasury through the Bridge system announces, two days in advance, the details of the scheduled offering. The GSEDs can submit their respective bids using the Bridge network, which are electronically linked to the Btr's Automated Debt Auction Processing System (ADAPS) from 10:00 AM to 1:00 PM. After the cut-off time, the BTr will then array submitted bids after which the Auction Committee will then decide what bids to accept. The Btr then downloads/transmits the accepted tenders to the ROSS System. Once downloaded, individual security accounts of winning bidders are automatically updated. Cash settlement reports can now be generated and forwarded to the BSP. These cash settlement reports serve as the basis for debiting the demand deposit accounts of the winning GSEDs. On the *secondary market* transactions, the GSEDs/non-GSEDs input settlement instructions for done deals in their Bridge Interface, which are electronically linked to the ROSS system. Each dealer shall use his confidential ID and password to activate the system and authorise every transaction. Once matched, the transaction is sent electronically to the ROSS. Individual accounts are automatically updated after downloading of matched transactions to the ROSS System is completed. For the corresponding cash settlement, the BTr generates and then sends the trade settlement reports to BSP. The BSP, in turn, will post the net trading results in the individual demand deposit accounts.

f. Pricing Policies

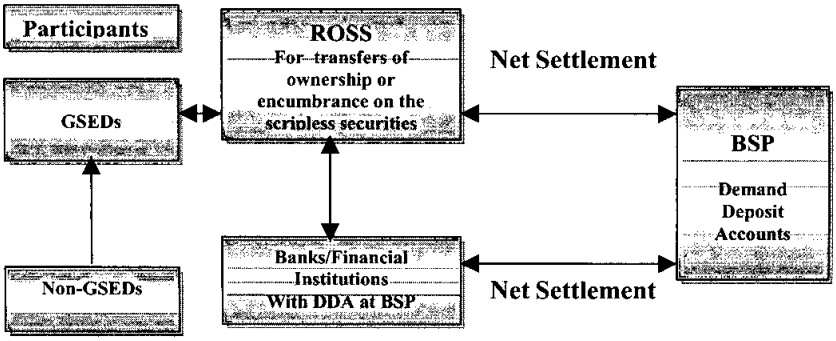
Monthly subscription fees are being assessed by the BTr against all banks/ financial institutions and individuals maintaining principal and client securities accounts with the ROSS. Monthly fees range from P5000 for each principal securities account to P1000 for every client securities account or per individual.

g. Management of Risk

RoSS will not pose any risk to BTr, as this is a unit under this Office. BTr will see to it that it has full control over its operations.

As to the BSP or the participants, ROSS will not in any way pose any risk, as under the said system, all government securities transactions are uncertified and therefore not negotiable just like under the Book Entry System (BES) of the BSP. The ROSS system can also validate if a participant's securities inventory is insufficient to settle a trade, in which case said transaction will be queued until the deficiency has been corrected.

Figure 5. Transfers of Ownership or Encumbrance on the Scripless Securities



2.1.3.5 Philippine Domestic Dollar Transfer System (PDDTS)

a. Participants in the System

Philippine commercial banks allowed to engage in spot transactions at the PDS are participants in the PDDTS (please refer to Figure 6 for the diagram of PDDTS flow of operations).

b. Types of Transactions Handled

The dollar side of the PDS transactions is settled at the PDDTS. The peso side of the deal is settled via manager's checks for interbank transactions and via debit/credit of the banks' regular demand deposit accounts at the BSP for transactions with the BSP.

c. How the System Operates

Citibank operates the system together with the PCD. On-line transfers go directly to Citibank while batch netting is undertaken by the PCD. Settlement is done through book transfers in the US dollar accounts of participants maintained with Citibank Manila. Each participating bank maintains a non-checking, interest-bearing, FCDU (i.e., US dollar) current account with Citibank, Manila, which acts as their clearing account. Outward transfers from the banks' accounts are effected only at the end of the day; after all regular domestic dollar transfers are processed.

d. Volume of Transactions Handled

The PDS annual volumes of transactions from 1995 to 1999 are as follows:

Year	Volume (In Mio $)	% of Change
1995	10,101.91	-
1996	25,871.20	156%
1997	43,118.98	67%
1998	33,613.21	-22%
1999	43,346.38	29%
2000	33,363.86	-23%

Source: Citibank through the effort of Mr. Bobier and Mrs. Cruz.

e. Settlement Procedures

At the start of the day, the PCD shall accept the transfer of beginning balances of PDDTS accounts of participants from Citibank. Each participant may then commence sending electronic transfer instructions through the PCD system using Gross Settlement Real Time method (GSRT) anytime from 9:00 a.m. to 5:00 p.m. of a particular business day via the PCD electronic communications system. PCD shall accept and process these instructions. Upon receipt of said instructions, the PCD system shall automatically access the sending participant's PDDTS account balance. If the participant's account has sufficient funds to cover the transaction, the instruction will be implemented and the transfer effected. Once the transfer is effected, the funds of a particular sending participant become immediately available to the receiving participant and the settlement shall be final and irrevocable.

If the sending bank's PDDTS account balance, as reflected in the PCD system, is insufficient to cover the transfer, the instruction to transfer funds of the sending participant will not be processed, and the transfer will be placed on queue. Participants who may be temporarily short of funds during the day may then request Citibank to apply their respective daylight overdraft facility to the queued transactions.

f. Pricing Policies

A one time joining fee of Php250, 000.00 (plus 10% VAT) will be charged for each participating bank. While the costs per outgoing and incoming transfers (plus 10% VAT) is Php40.00. The miscellaneous fees are as follows:

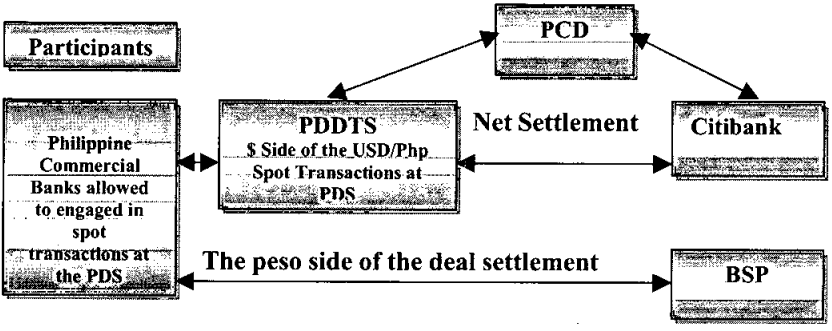
- Php7.00 per page for ordinary printing within five-day archive.
- Php10.00 per page for special printing beyond five-day archive.
- Php10.00 per page plus Php300.00 per hour for computer time for the restoration beyond five-day archive using back-up tapes.

g. Management of Risk

PCD sends electronic transfer instructions using Gross Settlement Real Time method (GSRT). The system will automatically access the sending participant's PDDTS account balance for settlement. If the participant's account has sufficient funds to cover the transaction, the instruction will be implemented and the transfer will be effected. Once the transfer is done,

funds become immediately available thus the settlement is final and irrevocable. However, if the sending participant PDDTS account balance is insufficient, the transfer of funds will not be implemented and it will be placed on queue. To avoid gridlock and settlement and liquidity risks, participants may request Citibank to apply their respective daylight overdraft facility.

Figure 6. USD/Php Spot Transaction at Philippine Dealing System



2.1.3.6 The Philippine Central Depository (PCD)

a. Participants in the System

The following are the participants in the Philippine Central Depository System: (please refer to Figures 7 & 8 for the diagrams of PCD flow of operations):

- **Direct Participants** are composed of the Securities Clearing Corporation of the Philippines (SCCP)- as Clearing House, Philippine Central Depository – for the book entry settlement of equities, ROSS of BTr – for the book entry settlement of listed Small Denominated Treasury Bonds, Settlement Banks – for settlement of cash obligations and entitlements, and all operating member-brokers
- **Indirect participants** are composed of custodian banks, financial institutions and transfers agents

b. Types of Transactions Handled

PCD system mainly handles trades on Listed Equities. However, with the recent listing of the Small Denominated Treasury Bonds (SDT) at the

Exchange, settlement for trades on fixed income securities has also commenced.

c. How the System Operates

All regular transactions in listed securities follow the T+3 settlement cycle, while settlement of SDT-Bonds follow the T+0 Cycle. The cash settlement obligations arising from the Exchange trades are settled or paid to the Settlement Banks. The SCCP, which is majority owned by the PSE effects settlement of trades through DvP. Settlement of Listed Equities is supported by a computerised system called Fintracs shared with the PCD and where settlement banks and brokers are connected, settlement takes effect between 12:00 – 1:30 p.m. on the third day after trade date. While settlement of listed SDT Bonds is supported by the PSE-ROSS systems interface. Although not part of the interface, cash settlement is also done via the same settlement banks with SCCP giving all settlement instructions. Settlement of SDTs takes effect between 12:30 – 1:30 p.m. on the same trade date (T+0)

d. Volume of Transactions Handled

The volume and value of trades handled by PCD from 1995 to 1999 were as follows:

Year	Volume (Millions)	Value (Billion Pesos)
1995	1,006,225.01	378.98
1996	2,273,827.53	668.82
1997	1,923,991.53	586.17
1998	287,791.46	408.68
1999	405,141.16	554.91

Source: PCD thru the effort of Mr. Bobier and Mrs. Cruz.

e. Pricing Policies

Trading of *listed equities* is done in terms of fixed minimum amounts called board lots. Depending on the price range of a particular stock, the unit of trading ranges from 10 to 1,000,000 shares. Cost of transactions therefore varies from company to company since prices of each company

differ according to its par value. Orders to be posted shall be limited to a maximum of three fluctuations from the last traded price and a capitalisation of P30 million pesos per order. Brokers may, however, impose their own limits per order for their trades. Limit orders shall be executed at a price band within the floor (minimum) and ceiling (maximum) price limits established by the Exchange for each security. Outside of the trading band, the price of the security shall be automatically frozen. This band is set not more than 50% up and not more than 40% down on a particular day, to be reckoned from the last closing price or at last posted bid price whichever is higher. While the price of *SDT-Bonds* is quoted as a percent of its face value up to the sixth (6^{th}) decimal place.

f. Settlement Procedures

The descriptions of the settlement procedures of the transactions under PCD were combined under item c) of this section.

g. Management of Risks

To minimise risks in securities transactions, the PCD implemented the following measures:

- Move from scrip settlement to scripless settlement (fungible shares) using book-entry-settlement where there is timely settlement of trades on settlement date.
- Immobilisation of shares at the depository also greatly diminishes if not totally eliminated instances of fraud, forgery and counterfeit certificates.
- Implementation of a DvP method of settlement where principal and daily settlement payment illiquidity risks are eliminated.
- Establishment of a Clearing and Trade Guarantee Fund where there will be an immediate and ready source to cover the temporary illiquid positions of the market player, thus domino effect that could lead to systemic fail is covered.
- Implementation of Fails Management System where the buying-in of undelivered sold securities of the selling-out of the unpaid bought shares is executed.
- Implementation of Mark to Market Collateral Deposit System that addresses the risks created by price fluctuations faced by trades that have not yet reached their settlement date.
- Shortening of the settlement cycle of listed securities from T+4 to T+3.

Figure 7. Trades on Listed Securities

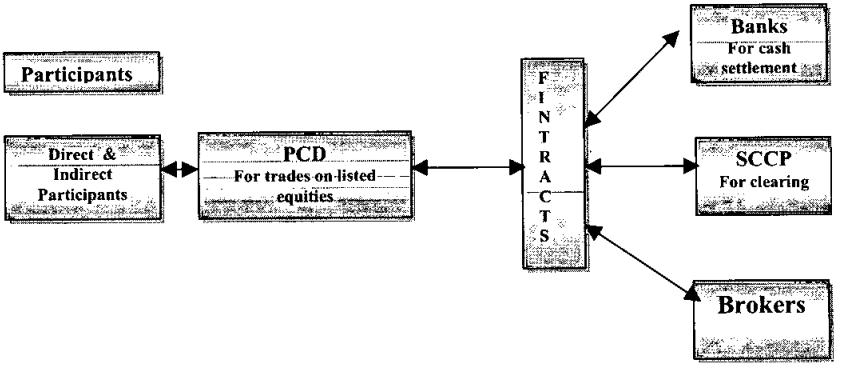
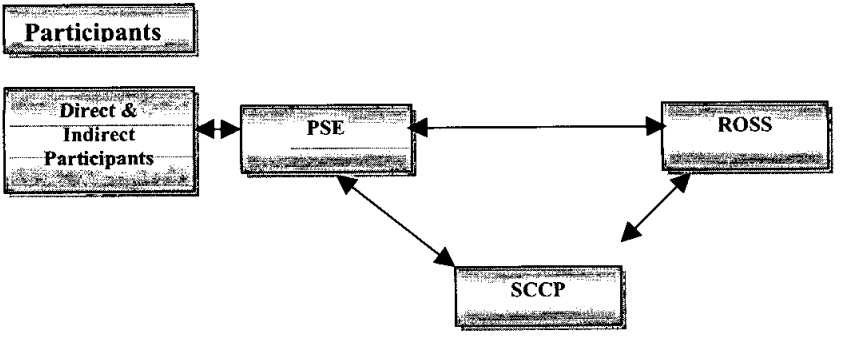


Figure 8. For Trades on Small Denominated Treasury Bonds



2.2 Cross Border Payment and Settlement Systems

For overseas customers of Philippine banks, the bulk of transactions are settled through SWIFT and some big banks settle their transactions through their electronic in-house settlement system.

(Note: The information and data on the payment instruments, structures, operations and administrations of the cross border payment and settlement systems in the Philippines are not available.)

3. The Implications of the Existing Payment and Settlement System for Financial Stability

3.1 Monetary Policy

3.1.1 Timely Information and Lower Transaction Costs

Major instruments used by BSP in the conduct of monetary policies include open market operations, imposition of reserve requirements and rediscounting operations. In the conduct of open market operations, BSP enters into repurchase (RP) or reverse repurchase (RRP) agreements with banks and in the purchase/sale of government securities. BSP's borrowings and lendings are thus, settled through direct debits/credits against banks' demand deposit Accounts (DDAs), while interbank transactions are settled in the same day using the MIPS. In turn, this system has enhanced the efficiency in managing DDAs of banks due to the shortened lag in the flow of information on DDA balances. The electronic settlement and clearing payments and authentication of IBCL transactions has also reduced the transaction costs of both banks and BSP.

3.1.2 Reduces the Risk of Non-delivery Securities and Administrative Costs

BSP also plays an active role in the purchase and sale of government securities for its own account. Transfers of securities are recorded under the ROSS system. This system facilitates the trading of government securities under a DvP scheme on RTGS basis. In its rediscounting operations, proceeds of loans are directly credited to borrowers' demand deposit accounts while corresponding loan payments are immediately debited against the said accounts. This system reduces the risk of non-delivery of securities and lessens the administrative costs for both the government and securities dealers. Settlement is done normally by debiting the buyer's DDA with BSP. At the end of the day, results of clearing are forwarded to BSP for posting to respective DDAs. The ROSS settles and clears all trades in government securities on a DvP system and on a RTGS basis. Dealers can open securities sub-accounts in the name of their clients for the purpose of segregating government securities sold in the secondary and tertiary markets under one account, provided that the dealers maintain complete records of their clients in their own books.

3.1.3 Summary

The automation of payment and settlement systems has been instrumental in the effective implementation of monetary policies by BSP in the following aspects:

- The existing domestic payment system allowed the settlement of payments almost instantaneously with the transactions made. These facilities enable banks to accurately monitor and comply with their reserve requirements as well as to estimate their liquidity or financial risks that arise due to lags or delay in information.
- A more accurate and timely information on banks' liquidity position also helps monetary authorities to assess broad monetary movements, implement measures and gauge the impact of such measures within a shorter period of time.
- A more efficient payment system creates accuracy and precision in the reporting of the broad monetary aggregates, particularly reserve money (RM), base money (BM) and domestic liquidity (M3). This contributes to a more effective implementation of monetary policy.
- Significantly reduced time lags between transaction, settlement and recording made possibly by the existing payment system facilitated the transmission of monetary policy actions to the financial markets, contributing to a more effective implementation of monetary policy.

3.2 Payment System Oversight

BSP, as the settlement bank, exercises oversight role on the payment system to ensure its efficiency and soundness by supervising and regulating the main providers of payment services in the Philippines.

BSP also has operational responsibilities over retail payment in the Philippines. With the cooperation of the BAP, BSP established the PCHC for bank-to-bank settlements. Supervision of payments due for clearing in the Philippines, particularly in Metro Manila and nearby areas, is one of the responsibilities of PCHC in coordination with BSP for the net settlement. The deposit reserves maintained by the banks with the BSP serve as basis for the clearing of checks and the settlement of interbank balances relative to banks' deposit reserves with the BSP.

Outside Metro Manila, clearing is undertaken in Regional Clearing Units (RCUs) designated by the BSP. These RCUs are solely controlled

by BSP, which imposes administrative charges and other fees upon the clearing participants for the maintenance of the clearing facilities. Said clearing fees are determined on a pro-rata basis using the participant's number of branches as basis for computation.

The central bank performs its oversight role in payment systems through the careful monitoring of payment transactions, which aims to minimise the occurrence of systemic risks. In retail payment systems, the central bank must be able to identify the barriers to the efficient functioning of the payment systems and address these barriers through the proper administration of existing rules and regulations. The rules, regulations and procedures under which BSP clearing units operate are covered by the BSP clearing guidelines and procedures issued to all member banks/participants.

Efficiency in the implementation of a payment system tops the list of concerns of the BSP in implementing monetary policies as part of its role as a central monetary authority in the country. The central bank is likewise responsible for strengthening public confidence in the payment systems through the promotion of competitive markets, adoption of risk controls that foster its safety and efficiency, and implementation of measures that enhance consumer protection in light of the complexity of existing payment services.

The settlement process is one of the major concerns of the BSP. In view of this, BSP is currently upgrading the existing payment system and developing it into an RTGS system, which hopes to enhance the operational efficiency, reliability, speed, and timeliness of payment transactions in the face of the rapidly increasing volume and value of payment transactions. This new payment system will address potential settlement and systemic risks in the interbank settlement process.

3.3 Competition/Innovation

The PCHC was formally established by the BAP as a private corporation, with a Board of Directors composed of members drawn from participating banks and institutions represented by their bank presidents and senior officers.

4. Consumer Protection

4.1 Against Excessive Cost

As in the case of the PCHC, this institution charges the participating member banks with processing fees per transaction item sent through the system. Pricing policies are promulgated and approved by the Board of Directors of the PCHC, which is wholly owned by all commercial banks that are likewise members of the BAP.

4.2 Reliability of the Payment and Settlement System

In the PCHC system, all images of cheques sent for clearing are archived in microfilm files and kept in a vault, while clearing reports and transaction lists are stored in CD Roms. Indexing schemes were implemented to facilitate research and reproduction requirements. PCHC follows a 5-year minimum retention period for its archived files.

The computer system configurations, which are completely redundant, are housed within the premises of the BSP. The creation of a secondary back-up site in the Makati area is currently being planned.

5. Recent Payment and Settlement System Development and Policy Initiatives

5.1 National Government Initiatives

Among the initiatives taken by the national government to support and strengthen the payment and settlement systems in the country are the following:

- **E-Commerce Act.** Republic Act (RA) No. 8792, otherwise known as "Electronic Commerce Act of 2000" was signed into law by former President Joseph E. Estrada on June 14, 2000. The Act provides for the recognition and use of electronic commercial and non-commercial transactions and documents, and penalties for unlawful use thereof. It also aims to facilitate domestic and international dealings, transactions, arrangements, agreements, contracts and exchanges and storage of information through the utilisation of electronic, optical and similar medium, mode, instrumentality and technology to recognise the authenticity and reliability of electronic documents related to such activities

and to promote the universal use of electronic transaction in the government and general public.

- **The Government Information Systems Plan (GISP).** In July 2000, Executive Order No. 265 approved and adopted the GISP, also to be known as "Philippine Government Online," as framework and guide for the computerisation of key frontline and common services and operations of the government to enhance overall governance and improve the efficiency and effectiveness of the bureaucracy.
- **Information Technology and Electronic Commerce Council (ITECC).** Executive Order No. 264 established the ITECC from the merger of the National Information Technology Council (NITC) and the Electronic Commerce Promotion Council (ECPC) in July 2000. It is mandated to transform the Philippines into a knowledge-based economy by harnessing the potentials of information and communications technology.
- **Setting Up of Clearing and Settlement House for Foreign Investment in Debt Instruments.** The government is currently laying the groundwork for the setting up of a clearing and settlement house that would facilitate foreign investments in debt instruments. Expected to be in place by next year, this clearing house will help reduce risks of non-delivery of related items, and is envisioned to allow government securities dealers to link up with international clearing houses such as Cedel and Euroclear. It will transform the present settlement system to one, which requires payment upon delivery of the instruments from the present book-entry system where no physical delivery takes place.

5.2 BSP's Initiatives

The BSP took the following initiatives to promote safe and efficient payment and settlement systems in the country:

- **MIPS 2.** In April 2001, MIPS was enhanced to MIPS2. It employs a gross settlement system in which processing and settlement of fund transfer instructions and scripless securities transactions take place simultaneously. The transfers of funds are settled individually. The system provides intra-day finality for individual transfers and eliminates end-of-day net settlement process. Initially, the transactions covered under MIPS 2 are those involving Interbank Call Loans (IBCLs) and Repurchase Agreements (RPs). Under MIPS 2, transactions will be queued and settled on a First In-First Out (FIFO) basis by the BSP's Financial Accounting System (FAS) using its server time strap as ba-

sis for time of receipt of electronic instructions and control of cutoffs. FIFO processing will not be applied in case of insufficient balances; the FAS will attempt to settle the next transaction in the queue. Every reserve deposit will carry a maximum settlement limit with the default value of 100% of the reserve deposit. BSP can reduce the limit depending on any special action required on the basis of any special conditions that will have to be set by the Monetary Board from time to time. All BSP loan maturities and GS redemptions will be settled first at the opening IBCL window at 10:00 AM while unsettled IBCLs at 9:45 AM, and 4:00 PM. At 6:30 PM, unsettled IBCLs due to insufficient funds will be cancelled.

- **Extending the PDS to other Service Providers.** In the foreign exchange market, the BAP and the BSP is currently considering to extend the current PDS trading to two other competing service providers, namely the Bloomberg and Reuters. This will improve information retrieval, price discovery and the capacity to obtain a fair value for the traded currency for participating banks. Also, by opening up the system to other service providers, information about currency and exchange rate movements will become available to a broader base of foreign banks and commercial clients.

5.3 Private Company's Initiatives

5.3.1 Introduction of Smart Cards

Among the smart cards introduced locally are the following:

- **Visa Electron Card**. It is a debit card product that functions like a credit card by allowing the user to pay for purchases and bills without the need to use cash. However, instead of providing the user with a credit line, the card enables him to readily draw from his existing account with his bank.[26]
- **Mondex "electronic wallet"**. It is a smart card that can be used for virtually the same application as a credit card. However, it can be reloaded with value, either through reloading stations in high-traffic areas, bank automated teller machines and branches, and the internet.

26. Murray, J. General Manager, Southeast Asia and Greater China, Visa International, "First Imperative: Get Filipinos Used To Cashless Transactions," i.t. matters, Business World Internet Edition, Manila Philippines, Thursday, September 07, 2000.

The card can be loaded also with other applications such as transportation tickets, loyalty programs, and identification information. It is embedded with a 16-kilobit memory chip, which runs on the Multi-Application Operating System (Multos) that allows cardholders to add or delete applications at will.[27]

- **PLDT e-purse or VISA Cash Card**. It is a stored value card that is reloadable. It may be used to make phone calls at PLDT's payphones, to pay for purchases at the local department store, and food corporation's fast-food chain of stores. Users of the cash card may load value into the card either by debiting an amount from their bank accounts or over-the-counter, in identified reloading centers. PLDT is currently pilot-testing the cash card at a local department store and installed 16 point-of-sale terminals.[28] It is a micro-payment system that aims to tap people not served by credit card holders. It uses VISA International's smart card technology, which harness the power of microchip embedded on a plastic card.[29]
- **Smart Money**. It is a smart card with magnetic-strip-based electronic purse that allows the cardholder to reload cash value into their cards through Smart-designated reloading centers. Reloading of cash value can also be done via mobile phones and GSM network. In March 2001, the SMART Communications Inc. and Megalink, a consortium of banks sharing a common ATM network,[30] agreed in principle to allow users of Smart Money to use Megalink's network of ATMs for transactions.[31]

5.3.2 Other Initiatives

- **Internet Startup to Float an Initial Public Offering**. The Philippine Stock Exchange (PSE) recently permitted the country's first true Internet startup, Diversified Financial Network (DFNN), to float an initial public offering. DFNN is a Website that offers financial informa-

27. Vea, O.B., Chairman, Mondex, "E-Purse, Anyone?," i.t. matters, Business World Internet Edition, Manila Philippines, Wednesday, October 18, 2000.
28. Villamor, R.J., "ePLDT to issue chip-based card," Business World, March 29, 2001.
29. Labadan, J., Asst. Vice President, PLDT, "Local fastfood chain giant tests PLDT e-purse service," INQ.net, Infotech, Philippine Daily Inquirer, Wednesday, March 21, 2001, Philippines.
30. The consortium controls more than 1,600 ATMs in the Philippines.
31. Oliva, E.L., "Megalink partners with Smart for mobile commerce initiative," INQ.net, Infotech, Philippine Daily Inquirer, Wednesday, March 21, 2001, Philippines.

tion, online banking, and stock trading was scheduled to go public this year.[32]

- **Proton-based smart card.** Proton World (PW) and Alittleworld.com Private Limited (ALW) signed agreements granting ALW Proton operating licenses for India and Philippines in 17 July 2000. In the Philippines, ALW will implement its Proton-based smart card scheme as part of a joint venture with VGM Corporation, Prosys (the previous holder of Proton licenses for India and Phils.) and other strategic partners representing banking, telecom and Internet interest. ALW's Proton-based dual purpose smart cards will provide end-users with a secure and practical alternative to cash without the limitations on eligibility or restrictions on usage associated with credit cards.[33]

6. Suggestions and Recommendation on the Role of BSP in Ensuring the Safety and Efficiency of the Payments Council and Serves as the Oversight Body

6.1 Creation of a National Payments Council and Serves as the Oversight Body

At the center of modern payment systems, central banks play an important role because it is central banks' liquid liabilities-and more particularly reserves balances-that are the instrument in which the bulk of domestic payment obligations are finally settled. The BSP has a legitimate and important role in guaranteeing the safety, soundness, efficiency and fairness of the payment system. As the lender of last resort, it must have the information and the means to oversee and, if necessary, assist the institutions participating in the payments system. Given the roles played by the BSP and its special responsibilities to avoid systemic risk, any large-value payment mechanism requires BSP's particular attention.

An important component of the central bank's leading role is to create an organisational structure to interact domestic and external actors, func-

32. Poe R., "The Philippines is poised to move into the New Economy limelight," e-Business, Business 2.0 Newsletter, 09/29/2000.

33. Gupta, A., Director, Alittleworld.com Privet Ltd., "Alittleworld.com becomes new Proton licensee for India and the Philippines," Alittleworld.com, Brussel and New Delhi, 17 July 2000.

tions and interests. This paper suggests and recommends that the BSP must take the initiative of setting up a national payments council (NPC) to lead payment systems reform as well as serve as the oversight body.[34] The main objectives of the NPC are: to be a forum (talking shop) for the central and commercial banks to discuss and agree on how to establish and oversee the functions of the national payment system and how to coordinate central and commercial banks' policies in the payment system (the harmonious development of inter and intrabank payment systems), and to be a channel and to absorb external technical assistance.[35]

6.2 Promotes Compliance with the Core Principles for SIPS

Payment and settlement systems are potentially a key institutional channel for the propagation of systemic crises. The failure of one or more institutions to settle or the fear that they might be unable to do so can trigger and spread a financial disturbance. One of the measures to prevent systemic crises is to carry out a self-assessment against the Core Principles in all the systemically important payment and settlement system (SIPS) in the country to determine the level of compliance. Compliance with the Core Principles ensures that all SIPS in the country meet the current best practices of safety and efficiency. Thus, it is recommended that the BSP should not only work towards this objective, but should also apply the Core Principles, or relevant aspects of it, to other payment systems with system-wide impact.

6.3 Fosters Regional Cooperation

The payment and settlement systems in the SEACEN-member countries have steadily evolved in reaction to increasing volumes and values of transactions, technological progress, and a growing awareness of both the public and private institutions of the risk inherent in clearing settlement arrangements. A similar evolution, however, has not occurred in cross-border payments systems in the region, which still rely heavily on tradition-

34. please refer to Figure 10 for the organisational structure and a charter outline for a hypothetical NPC)

35. Listfield R., Negret F.M., "Modernising Payment Systems in Emerging Economies," World Bank Policy Research Working Paper 1336 (1994), pp. 13-17.

ally correspondent banking arrangement in spite of a considerable increase in the volume and value of transactions. It is recommended; therefore, that BSP should foster regional cooperation of payment system policy, especially in areas such as the legal framework, risk management policies in clearing and settlement systems, business hours, and certain standards and infrastructure.

6.4 Payment and Settlement System Innovations

The ways that a bank interacts with its customers are becoming ever so complex with the emergence of an entirely new generation of payment processing. The increase usage of the internet as well as customer acceptance of the smart cards as a payment instruments has changed the traditional role and infrastructure for payment processing. Technology today allows non-traditional players to enter the market place of payment processing. This is fragmenting or desegregating the entire payment systems. This brings about the risk of marginalising the role of Banks as well as the BSP. While the issues like money-laundering, velocity of money – hence money supply will have also to be taken seriously by the BSP. In this regard, this paper recommends and suggests that the envisioned NPC of the Philippines should take the following innovations in the payment and settlement systems of the country:

6.4.1 Cheque Truncation

The present processing procedures for cheques and demand drafts in the PCHC and BSPs-RCUs include physical movement of cheques and demand drafts among branches, headquarters and clearing houses. This takes a high operational cost and has been a detrimental factor to the improvement of productivity by bank branches. Under the truncation system, each branch or regional center of a participating bank captures information on bills & cheques and converts it into electronic data for use by an automatic recognition device. These electronic data are transmitted to the clearing house by way of the bank's computer center, and the physical bills and cheques are kept at the branch or regional center of the payee's bank. Thus, this paper suggests and recommends the introduction of cheque truncation, through which the process of collection of cheques & bills is completed through the exchange of digital data only, without the actual physical transfer of items.

6.4.2 Interbank Fund Transfer System

The Interbank Fund Transfer (IFT) System is an electronic fund transfer system that allows customers to remit nationwide on a real-time basis using any bank, whether or not he/she maintains an account with it, for the transfer of funds to a payee holding an account at any bank. It is made possible by interconnecting banks through a switching computer. The remitting bank transfers the funds to the payee's account in a real-time mode through the IFT system network.

6.4.3 Interbank Cash Dispenser and Automated Teller Machine System

The Interbank Cash Dispenser and Automated Teller Machine (CD/ATM) System permits a joint use of the computer resources of all banks. Customers can use the CDs and ATMs of any bank to make cash withdrawals or fund transfers.

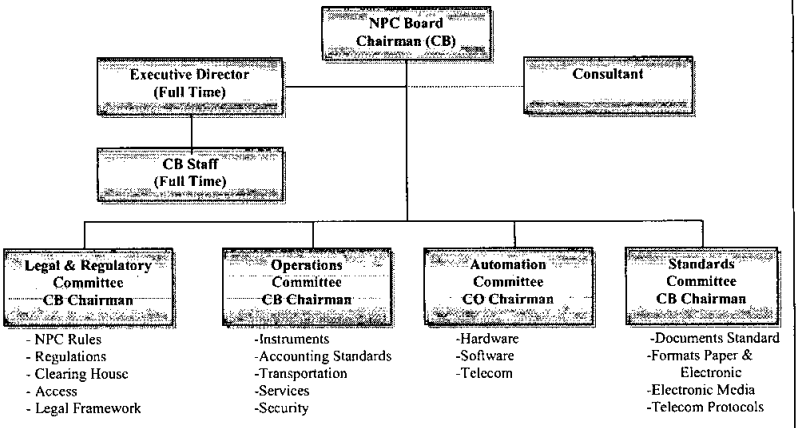
6.4.4 Automatic Response Service System

The Automatic Response Service (ARS) System allows a customer to obtain certain information such as deposit balances, details of their credit card payments or of transactions made through their accounts without the use of a passbook (e.g. direct debits, etc.) and information on the exchange rates of major currencies, and various other financial services by telephone or personal computer connected to the computers of a financial institution through a switching computer. Customers may also make use of the ARS to transfer funds between different accounts maintained within the same bank. It also handles notifications concerning changes in financial products and confirmation of cashier's checks against a list of those stolen or lost.

6.4.5 Electronic Payment System for E-Commerce

The BSP should take initiative in developing an electronic payment system for Business to Business (B2B) and Business to Customer (B2C) e-commerce. Through this system, on-line payment services for B2B and B2C e-commerce and interbank settlement services will be provided by linking purchasing and vending companies, banks, a clearing center and a certification authority.

Figure 10. National Payment Council
(Sample Organisational Structure)



Note CB = central bank, and CO = Commercial Bank

Source: Listfield R., Negret F.M., "Modernising Payment Systems in Emerging Economies," World Bank Policy Research Working Paper 1336 (1994).

Country Tables

Table 1. Major event affecting the payment and settlement systems in Philippines

Date	Major Development
March 1977	Philippine Clearing House was established by the Bankers Association of the Philippines (BAP)
October 1995	Adoption of MIPS as settlement of interbank loan transactions
November 1996	Bureau of Treasury (BTr) has taken the function of booking securities through the Registry of Scripless Securities (RoSS)
December 1996	Bridge-RoSS Interface launched
January 1997	Equities conversion from scrip-based to book-entry settlement process commenced
December 2000	Adoption of MIPS2 to support the implementation of Circular 266

Table 2. Basic Statistical Data

	1995	1996	1997	1998	1999
Population (millions): *Year end*	70.27	71.9	73.53	75.16	76.78
GDP (current in million dollars) (current in million pesos)	74120 1905951	82848 2171922	82344 2426743	65492 2678187	76655 2996371
GDP per capita (current in million pesos)	27123	30208	33003	35633	39025
Exchange Rate (against USD) *Year end* *Average*	26.214 25.7144	26.288 26.2157	39.975 29.4707	39.059 40.8931	40.313 39.0890
GDP (constant in million pesos)	802224	849121	893151	887905	917382
GDP per capita (constant in million pesos)	11416	11810	12147	11814	11948

Table 3. Settlement media used by non-banks

	1995	1996	1997	1998	1999
Notes and coin					
Transferable deposits					
Narrow money supply (M1)*	184,931	221,957	258,318	281,514	394,127
Memorandum item: Broad money supply (M3)*	761,430	881,404	1,066,017	1,144,552	1,365,098

** outstanding amount for the monetary system (in million pesos)*

Table 4. Settlement media used by banks (in billion pesos)

	1995	1996	1997	1998	1999
Reserve balances held at central bank of which: Required reserves Free reserves	111.8	130.0	157.0	168.8	102.9
Transferable deposits					
Memorandum item: Institution borrowing from central bank	13.5	14.1	34.4	31.7	26.9

Table 5. Institutional Framework (1999)

Categories	Number of institutions	Number of branches	Number of accounts	Value of accounts
Central Bank	1	3 Regional Offices and 15 Regional Units		303.52 a/
Commercial:				
Public	-			
Private	38	3,852		
Foreign	11	11		
Development & Investment banks:				
Public	3	411		
Private	-			
Foreign	-			

a/ consists of deposit liabilities of the BSP

Table 6. Cash dispensers, ATMs and EFTPOS terminals

	1995	1996	1997	1998*	1999
Cash dispensers and ATMs:					
Number of networks					
Number of machines	2,0	2,	2,	3,261	3,483
Volume of transactions	89	402	879		
Value of transactions					
EFTPOS:					
Number of networks					
Number of machines					
Volume of transactions					
Value of transactions					

Table 7. Number of payment cards in circulation (at year-end, in thousands)

	1995	1996	1997	1998	1999
Cards with a cash function					
Cards with a debit/credit function [2]					
of which					
Cards with debit function					
Cards with credit function					
Cards with a cheque guarantee function					
Memorandum item:					
Retailer cards					

Table 8. Payment instructions handled by selected payment systems: volume of transactions (in millions)

	1995	1996	1997	1998	1999
Philippine Interbank Clearing System *Cheques*	101.782	111.975	116.713	112.838	116.210
Credit transfer-Php/USD Transactions	0.264	0.312	0.377	0.453	0.479
Giro System					
Interbank Clearing House	0	0	0.130	0.120	0.168
Post Office: *Postal money orders* *Postal cheques*					

Table 9. Payment instructions handled by selected payment systems: value of transactions (in billions)

	1995	1996	1997	1998	1999
Philippine Interbank Clearing System	n.a.	n.a.	n.a.	n.a.	n.a.
Cheques	P 9.016	P 18.660	P 65.698	P 71.540	P 147.736
Credit transfer-Php/USD Transactions					
Giro System					
Interbank Clearing House			1651.01	1776.68	3630.16
Post Office: *Postal money orders* *Postal cheques*					

Table 10. Indicator of use of various cashless payment instruments: volume of transactions

	1995	1996	1997	1998	1999
Cheques issued					
Payments by cards *Credit cards* *Debit cards*					
Paperless credit transfers					
Postal money orders					
Postal cheques					

Table 11. Indicator of use of various cashless payment instruments: value of transactions

	1995	1996	1997	1998	1999
Cheques issued					
Payments by cards *Credit cards* *Debit cards*					
Paperless credit transfers					
Postal money orders					
Postal cheques					

Charts

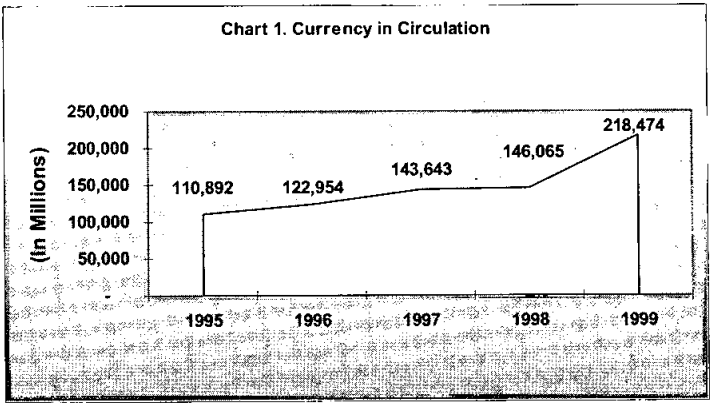


Chart 1. Currency in Circulation
(In Millions)
250,000
200,000
150,000
100,000
50,000
-
110,892
122,954
143,643
146,065
218,474
1995
1996
1997
1998
1999

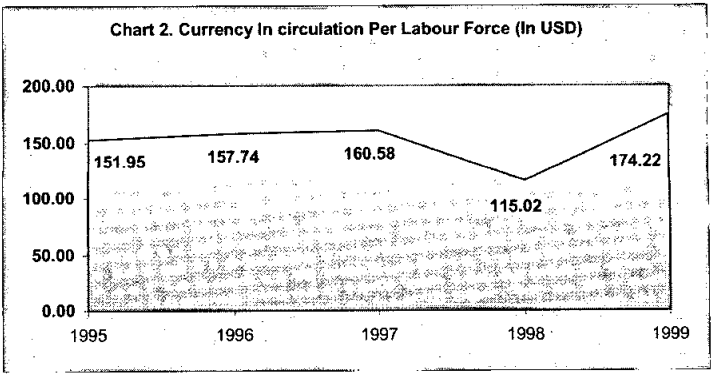


Chart 2. Currency In circulation Per Labour Force (In USD)
200.00
150.00
100.00
50.00
0.00
151.95
157.74
160.58
115.02
174.22
1995
1996
1997
1998
1999

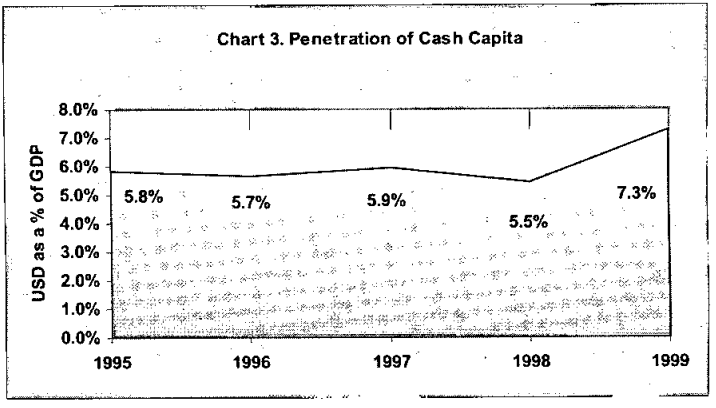
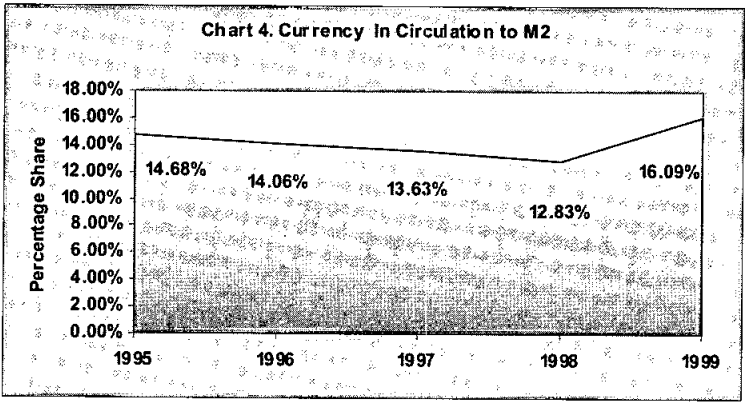
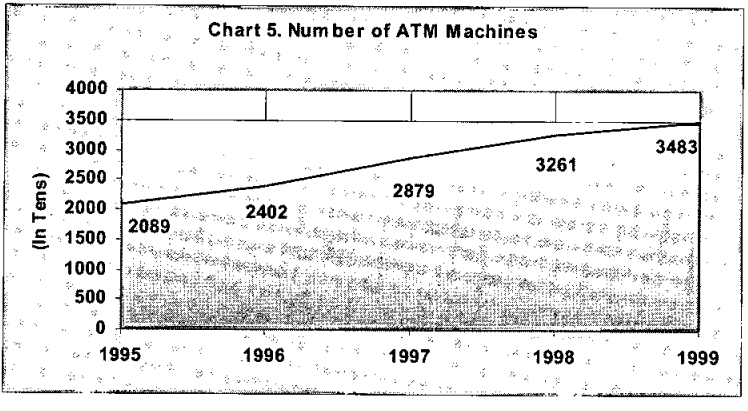
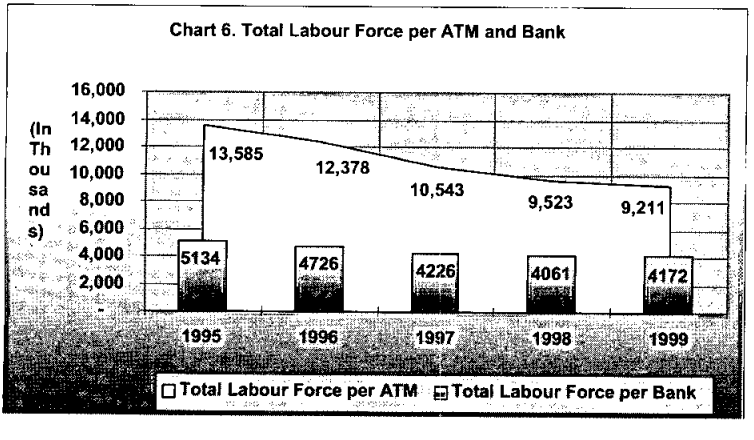


Chart 3. Penetration of Cash Capita
USD as a % of GDP
8.0%
7.0%
6.0%
5.0%
4.0%
3.0%
2.0%
1.0%
0.0%
5.8%
5.7%
5.9%
5.5%
7.3%
1995
1996
1997
1998
1999

Charts-cont'd







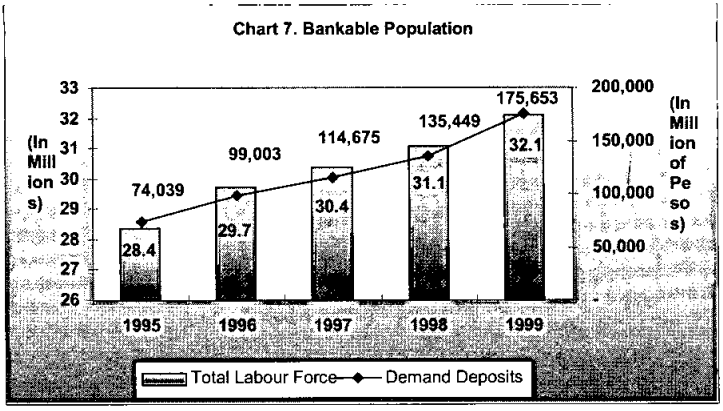


Chart 7. Bankable Population
(In Million s)
33
32
31
30
29
28
27
26
200,000
150,000
100,000
50,000
-
(In Million of Pesos)
74,039
99,003
114,675
135,449
175,653
28.4
29.7
30.4
31.1
32.1
1995
1996
1997
1998
1999
Total Labour Force
Demand Deposits

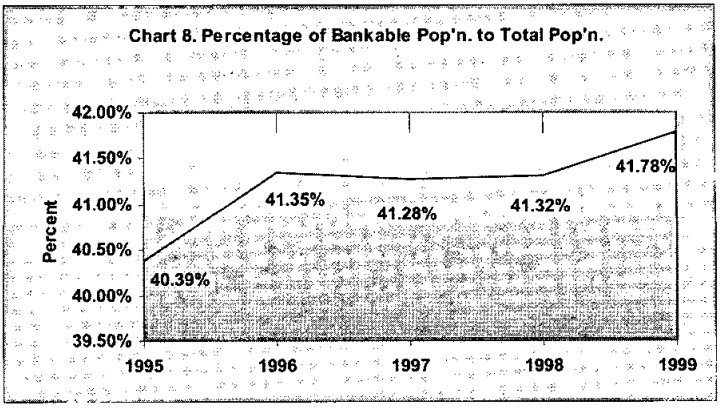


Chart 8. Percentage of Bankable Pop'n. to Total Pop'n.
Percent
42.00%
41.50%
41.00%
40.50%
40.00%
39.50%
40.39%
41.35%
41.28%
41.32%
41.78%
1995
1996
1997
1998
1999

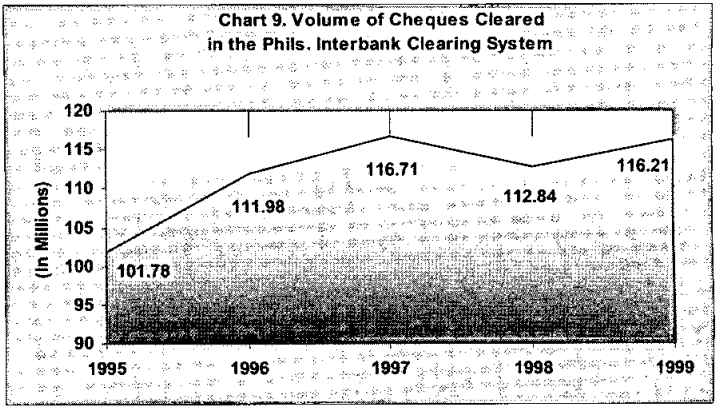
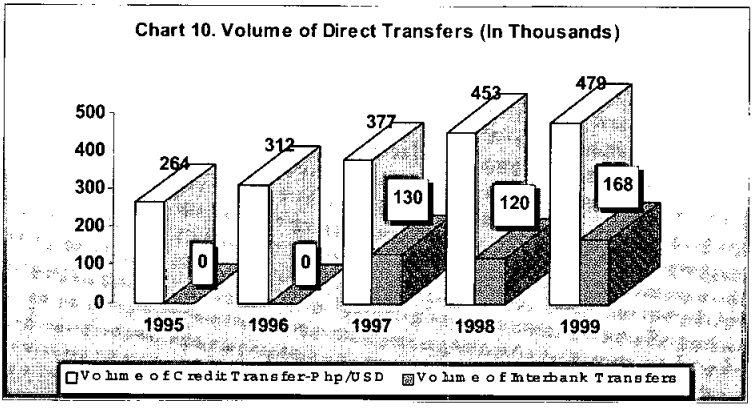
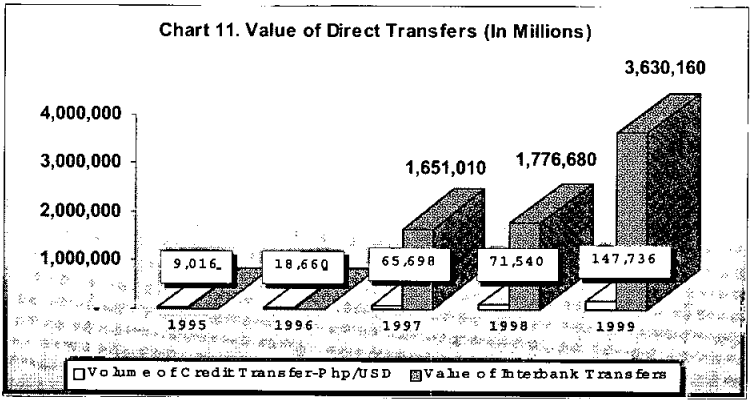
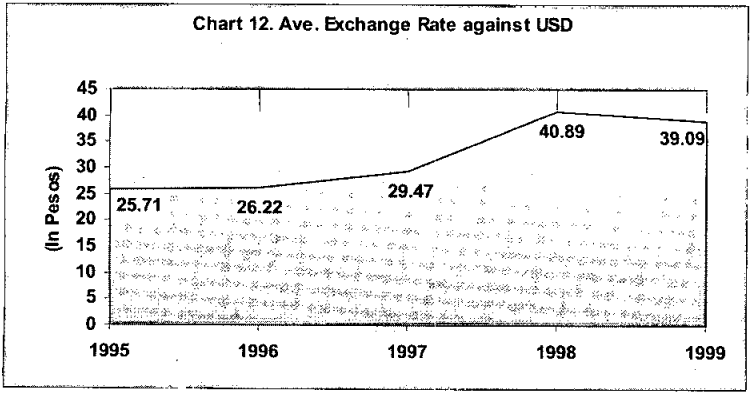


Chart 9. Volume of Cheques Cleared in the Phils. Interbank Clearing System
(In Millions)
120
115
110
105
100
95
90
101.78
111.98
116.71
112.84
116.21
1995
1996
1997
1998
1999

Charts-cont'd







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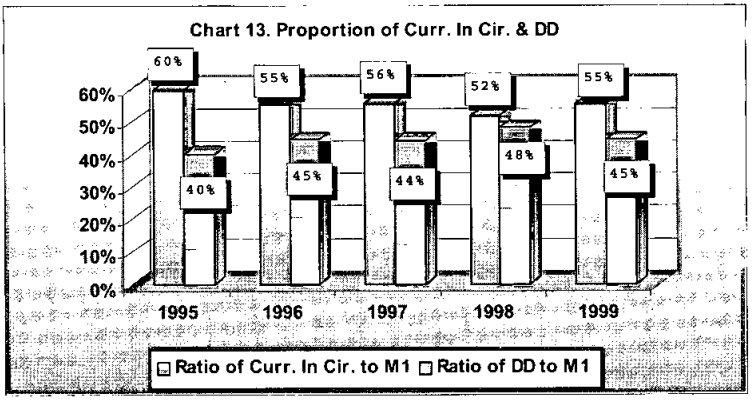
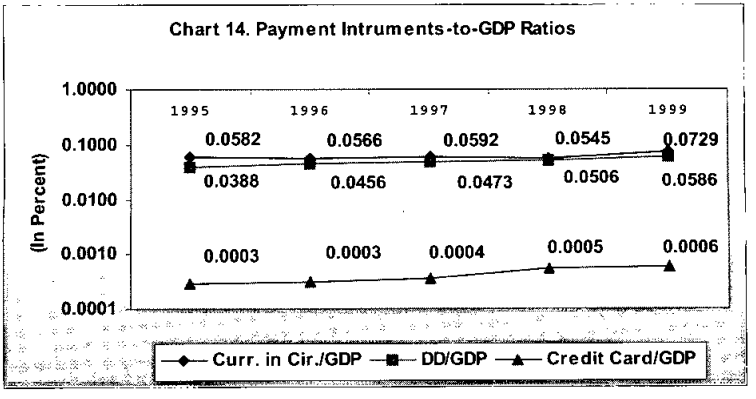
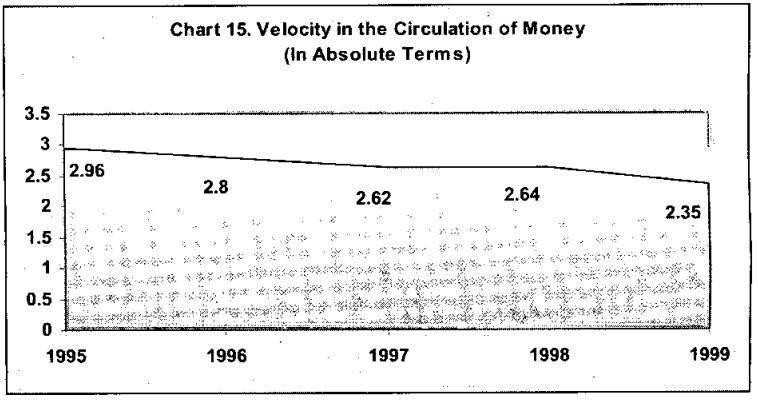






Multi-transaction Interbank Payment System 2 (MIPS2)

Description/Features

On 13 October 2000, the BSP Monetary Board approved the amendments to the rules on settlement of transactions involving interbank loans and government securities under repurchase agreements with the BSP. Transactions will be settled gross, on a trade for trade basis with finality subject to the availability of balances in the deposit reserves maintained by banks in the BSP.

The MIPS2 allows a more direct interface to the BSP's own computer and accounting systems and achieves settlement finality through the gross settlement of transactions and thereby reduces systemic risk (please refer to Figure 9 for the diagram of MIPS2 flow of operations).

The system is composed of the following components:

- **Front-end software** - This allows each participant to enter its IBCL transactions and transmit the same to the BSP through the Philippine Clearing House Corp. (PCHC) server in a secure manner.
- **PCHC Server** - This receives the electronic transfer instructions from the participants, validates and authenticates each electronic transfer instruction, and immediately relays the same to the BSP through the BSP Gateway.
- **BSP Gateway Server** - It acts as a transit point for the electronic transfer instructions and status files being transferred between the PCHC Server and the BSP's Financial Accounting System (FAS).
- **BSP's FAS** - This is the general ledger system of the BSP wherein all accounting entries to the BSP's books as well as the participants' Demand Deposit Accounts (DDAs) are posted. It also generates the statements of account for the DDAs, which are sent electronically to the participants on a regular basis.
- **BSP's cc:Mail System** -This is being used as the main delivery facility for sending official DDA statements to the participants.

Payment Instruments

IBCL transactions concluded during any of the trading windows shall be confirmed by telephone prior to settlement to ensure that all transaction

details are in order. After verbal confirmation, the party keys electronic payment instructions into the system whose DDA is to be debited.

Participants

Banks and non-banks performing quasi-banking functions with Demand Deposit Accounts with the BSP can participate by executing the Participation Agreement.

Transactions Handled by the System

Initially, the transactions covered under MIPS 2 are for Interbank Call Loans (IBCLs) and Repurchase Agreements (RPs) with the BSP

How the System Operates

Upon receipt of the electronic fund transfer instruction through the System, settlement of IBCL transactions shall be performed with finality by the BSP through the participants' DDAs.

Debit instructions shall be settled by the BSP on a gross, transaction-by-transaction, First In-First Out basis.

The BSP shall only post debit instructions if the sending participant's DDA is adequately funded. Otherwise, the transaction shall not be posted and shall be held in queue. If a transaction is held in queue due to inadequate DDA balances other succeeding transactions which are of lower value and which are within the available DDA balances shall be posted ahead of the transaction, which was held in queue.

Transactions that remain in queue until the IBCL window closes shall be cancelled from the System.

Participants are endeavored to transmit all repayment instructions for maturing IBCL borrowings during the first hour of operation of the System to improve liquidity in the System.

Annual Average Volume

The banking system started using the MIPS2 only in March 2001.

Pricing Policies

PCHC charges the amount of P100 for each electronic fund transfer instruction sent by the remitting participant. The transaction fee is subject to regular review by the PCHC for adjustment as may be deemed necessary.

BSP, on the other hand, charges the amount of P20 for each electronic fund transfer instruction received.

Risk measures

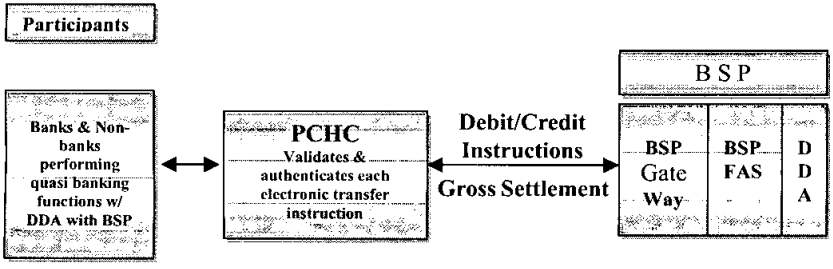
Since transactions are settled gross, on a trade for trade basis and with finality subject to the availability of balances in the deposit reserves maintained by banks with the BSP, risks are eliminated.

Each participant is responsible for ensuring the confidentiality, safety and security of its log-in IDs, passwords and authentication keys for activating the system and initiating IBCL transactions.

Each participant is legally bound by its electronic fund transfer instruction which it sent through the system without need of any other manually prepared confirmation, paper, or instrument, provided that the same has been authenticated by the BSP and provided further that they comply with the terms and conditions set forth in the Memorandum of Agreement.

The PCHC and the BSP are responsible for ensuring that adequate continuity of business (COB) plans are in place for uninterrupted operations.

Figure 9. MIPS for Large Value Interbank Transactions and Bank Transfers



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Chapter 8

THE PAYMENT AND SETTLEMENT SYSTEMS IN SINGAPORE

by

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1. Introduction

1.1 Historical Background

1.1.1 Establishment of the Monetary Authority of Singapore (MAS)

The MAS was established as a statutory board under the Monetary Authority of Singapore Act in 1970. Its mission is to promote sustained and non-inflationary economic growth, and a sound and progressive financial center. Except for the issuance of currency, which is entrusted to the Board of Commissioners of Currency, Singapore (BCCS), MAS performs all the functions normally associated with a central bank.

1.1.2 Establishment of the Singapore Automated Clearing House (SACH)

The SACH commenced its operations in 1982 with Banking Computer Services (BCS) Pte Ltd appointed as the operator of the SGD cheque clearing system (SGD CCS). The SGD CCS was first automated when the SCHA adopted MICR technology for the automatic sorting of cheques and computation of the cheques clearing figures. The system was further enhanced in 1992 with the introduction of the Electronic Clearing System (ECS), which facilitates the electronic transmission of cheque data to the SACH for processing. In addition to the SGD CCS, BCS also operates the

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Interbank GIRO system and USD cheque clearing system introduced in 1984 and 1996 respectively.

1.1.3 Establishment of Retail Electronic Payment Systems

In 1985, five local banks[1] jointly founded NETS, or Network for Electronic Transfers (S) Pte Ltd, to establish and operate an online direct debit payment network that allows the shareholding banks' customers to do online debit payments using their ATM cards via EFTPOS terminals at the Point-of-Sale (POS). In 1990, the other two local banks, Keppel Bank and Tat Lee Bank joined as NETS shareholders.[2]

The first ATM in Singapore was installed in 1979 by Chartered Bank, and many banks subsequently followed suit. In November 1988, NETS introduced the Shared ATM service, which connected all the shareholding banks' ATM machines into one single network, giving the shareholding banks' customers' wider access to ATMs. However, in 1998, DBS withdrew from the Shared ATM network following its acquisition of POSBank. There are now two main ATM networks in Singapore: NETS' Shared ATM network and DBS-POSB network.

In 1996, NETS launched the NETS CashCard system. This system allows consumers to make cash-like payments via CashCard terminals at participating retail outlets using monetary value in stored value smart cards.

1.1.4 Establishment of Large Value Interbank Payment Systems

The first automated large-value interbank payment system in Singapore was implemented and operated by BCS in 1985. The payment system, called the System for Handling Interbank Funds Transfer (SHIFT), was an end-of-day net settlement payment system. SHIFT was subsequently replaced by the MAS Electronic Payment System (MEPS), a real-time gross settlement system, in July 1998.

1. The Development Bank of Singapore (DBS), Oversea-Chinese Banking Corporation (OCBC), Overseas Union Bank (OUB), United Overseas Bank (UOB) and POSBank. POSBank was acquired by DBS in 1998. OUB merged into UOB in Dec 2001.
2. Keppel Bank and Tat Lee Bank merged to become Keppel TatLee Bank in 2000. Keppel TatLee Bank was later then acquired by OCBC Bank in Aug 2001.

1.2 Methods of Making Payment and Settlements

Singapore's payment system has evolved over the years, driven by technological progress, changing consumer needs and development of new financial activities. It has changed from one that was based essentially on paper and cash transactions to one today that has a diverse range of cashless payment instruments, supported by efficient and reliable clearing and settlement systems.

In Singapore, the common methods of making payments besides using currency include cheques, interbank GIRO and payment cards, which includes stored-value, debit and credit cards. Banks' customers can also use their ATM cards to make third-party account funds transfers and to make bill payments to certain commercial and government entities via the ATMs. In addition, banks also offer telephone, mobile and internet banking services to enable their customers to make bill payments and third party funds transfers.

1.3 The Institutions that Provide Payment and Settlement Services

1.3.1 Banks

Singapore's payments landscape is predominantly the domains of banks. As at end-December 2000, there were 134 commercial banks in Singapore, eight of which were locally incorporated. Commercial banks are licensed under the *Banking Act* (Chapter 19). Their activities are also governed by MAS Notices to Banks and guidelines issued from time to time. There are three categories of commercial banks in Singapore: full banks, wholesale banks and offshore banks.

Banks are currently the only institutions able to process across all segments of the payment process chain (acquisition, processing, clearing and settlement).

1.3.2 Full Banks

Full banks are authorised to transact the whole range of banking business, both personal and corporate. These include the operation of current, savings and fixed deposit accounts, financing of exports and imports, transfer of funds, commercial letters of credit, trust receipts, travellers' cheques and currencies. Full-licensed banks may also provide advice on trade and in-

vestment, foreign exchange regulations, and may furnish credit reports and trade information.

Most full-licensed banks provide the full range of retail payment services such as cheque services, funds transfers, issuance of credit and debit cards, as well as ATM and EFTPOS services.

As at end-December 2000, there were 31 full-licensed banks, eight of which were locally incorporated banks, while the remaining were branches of foreign banks. Foreign full banks face some restrictions on the setting up of branches and offsite ATMs. Currently, only full local banks can provide EFTPOS services.

1.3.3 Wholesale Banks

Formally known as restricted banks, wholesale banks may engage in the whole range of banking activity afforded to a full-licensed bank except that they may not:

- Accept Singapore dollar fixed deposits of less than SGD250, 000 per deposit from non-bank customers.

- Pay interest on Singapore dollar current accounts operated by resident individuals.

As at end-December 2000, there were 20 restricted banks in Singapore, all of which were branches of foreign banks.

1.3.4 Offshore Banks

The category of offshore banks was introduced in 1973 with the aim of improving the scope of activity in the Asian Dollar Market. Offshore banks enjoy similar opportunities as full and restricted banks for business in the offshore market, but their scope of business in the Singapore dollar retail market is limited.

In addition to the conditions imposed on restricted banks, offshore banks also cannot:

- Accept interest bearing Singapore dollar deposits from resident non-bank customers other than approved financial institutions.

- Extend total credit facilities in Singapore dollars exceeding SGD500 million to non-bank customers who are residents of Singapore. Qualifying offshore banks can offer credit facilities of up to SGD1 billion.

As at end-December 2000, there were 83 offshore banks in Singapore, all of which were branches of foreign banks.

1.3.5 Internet Only Banks

In July 2000, MAS issued a policy statement on internet banking in July 2000. MAS is prepared to grant new banking licenses for Singapore-incorporated banking groups to set up separate banking subsidiaries (including joint venture entities) to pursue new business models, including Internet-Only Banking (IOB), outside their existing banking entities. There is currently one bank operating under the IOB business model.

1.3.6 The Singapore Clearing House Association (SCHA)

The SCHA is an association formed in December 1980 to establish, manage and administer clearing services and the facilities for cheques and debit/ credit items of its members. It comprises MAS and the commercial banks in Singapore that wish to become members. The SCHA establishes the rules on the rights and responsibilities of the participating banks as well as the service providers for the various clearing systems. The SCHA is also responsible for the SACH, which runs the SGD and USD cheque clearing systems and the interbank GIRO clearing system.

1.3.7 Network for Electronic Transfers (Singapore) Pte Ltd (NETS)

NETS is a nation-wide electronic payments service provider, formed in 1985 by a consortium of local banks[3]. NETS aims to establish infrastructure, systems and services to facilitate electronic banking services and financial payments. The company commenced operations by offering a nation-wide Electronic Funds Transfer at Point Of Sale (EFTPOS) network, an online debit payment service. Over the years, NETS has evolved from providing a single service to providing multiple payment-related services, such as the shared ATM network and nation-wide CashCard system.

3. See footnotes 1 and 2.

NETS was recently restructured with a new consortium, comprising DBS and Singapore Telecommunications Limited (SingTel)[4], holding a 45% stake. DBS will transfer its existing stake to the consortium. The remaining 55% will be owned by NETS' existing shareholder banks, namely Keppel TatLee Bank, Oversea-Chinese Banking Corporation, Overseas Union Bank and United Overseas Bank.[5]

1.3.8 Credit / Charge Card Operators

The main credit card operators in Singapore are VISA and MasterCard, while American Express and Diners Club are the main charge card operators. These operators provide the international networks linkages between the merchant and the card issuing banks. The card operators switch the transaction to the card issuers that check the credit limit and verify the authenticity of the transaction.

1.3.9 SWIFT

The Society for Worldwide Interbank Financial Telecommunications (S.W.I.F.T.) was founded by 239 banks from 15 countries in 1973, with the purpose of providing technology-based communication services across all financial markets through member banks. Today, S.W.I.F.T. provides global secure communication to more than 7,204 financial institutions in 192 countries. The services provided include interfacing, store-and-forward messaging, interactive messaging, file transfers and message routing.

SWIFT was introduced in Singapore in 1979, and by 1983, there were 50 banks being connected onto the network. As at end-December 2000, there were 179 domestic institutional users, of which nine were locally incorporated institutions participating as full members. The remaining domestic institutional users were sub-members and participants, consisting of foreign commercial banks, investment advisors, securities houses and other financial institutions.

4. SingTel is one of the majr telecommunications operators in Singapore.
5. See footnotes 1 and 2.

1.3.10 The Monetary Authority of Singapore (MAS)

The MAS acts as a settlement agent for the banking institutions in Singapore, by allowing funds transfers to take place across the banks' settlement accounts held with the MAS. The MAS is also the operator of the MAS Electronic Payment System (MEPS). It sets the criteria and rules of participation in the MEPS, as well as the rights and responsibilities of the participating banks. Besides cash settlement accounts, banking institutions also hold Singapore Government Securities (SGS) settlement accounts with the MAS in the MEPS. Any transactions involving SGS are settled on a delivery-vs-payment (DvP) basis in the MEPS.

The MAS also handles government-related payments and receivables that usually take the form of funds transfers between the accounts of the government's accounts with the MAS and with the banks.

1.4 Legal Framework

A number of laws and bye-laws have a bearing on payment instruments and institutions in Singapore.

Cheques and GIRO transactions which are cleared through the Singapore Automated Clearing House (SACH) are regulated by the following laws and bye-laws:

- *Section 59 of Banking Act (Chapter 19, revised edition 1999)* allows the Monetary Authority of Singapore (MAS) to have the capacity to act with its own discretion, in a manner to ensure the operability of the Clearing House and the integrity of the financial sector.

- *Banking (Clearing House) Regulations, Cap.19, Regulation 1,* a subsidiary legislation administered by MAS sets the conditions with respect to clearing with the Singapore Automated Clearing House.

- *The Bills of Exchange Act* governs how cheques are drawn, accepted and paid.

- The *Bye-Laws of the Singapore Clearing House Association (SCHA)* state the rules and regulations for participation in the clearing of cheques and GIRO.

Section 77A of the Banking Act states that only banks authorised by MAS can issue multi-purpose stored value instruments. Other institutions are allowed to issue single purpose stored value instruments. Under the Act, MAS can also exempt institutions that issue multi-purpose stored value instruments before 8 Oct 1993.

Section 59A of the Banking Act makes provision for Real Time Gross Settlement (RTGS) system. The MAS is responsible for the smooth operation of the RTGS system and ensures full compliance with the regulations by its members. In addition, MAS has the power to authorise any party to operate the system and it may write rules in regard to the settlement system.

The *Currency Act (Chapter 69)* established the Board of Commissioners of Currency, Singapore (BCCS) in 1967. The Act conferred on the BCCS the sole right to issue currency in Singapore. A notable provision of the Act is that the Singapore dollar must be 100% backed by external assets. This is achieved through the maintenance of a currency fund consisting of foreign currencies, demand and time deposits, treasury bills and securities, and gold.

With the increasing trend towards electronic transactions, digital signatures are becoming more important, both for identification purposes and to serve as an alternative to hand-written signatures. Digital signatures are also useful in preventing unauthorised alteration of the contents of electronic documents. On 10 July 1998, the *Electronic Transactions Act* was enacted to provide for the legal recognition of digital signatures and establish the framework to further facilitate electronic commerce transactions in Singapore.

2. Existing Payment and Settlement Systems

2.1 Domestic Payments

2.1.1 General Overview

The Singapore Clearing House Association (SCHA) provides three payments clearing and settlement systems for its member banks:

- Singapore Dollar (SGD) Cheque Clearing System;

- United States Dollar (USD) Cheque Clearing System; and
- Interbank GIRO System.

The above clearing systems are operated under the Singapore Automated Clearing House (SACH). Obligations arising out of the Singapore Dollar Cheque Clearing System and the Interbank GIRO System are settled across current accounts held at MAS. There is a direct interface between the SACH and the MAS Electronic Payment System (MEPS) to facilitate multilateral net settlement of these payment obligations on a deferred basis.

Obligations arising out of the United States Dollar Cheque Clearing System are settled across participants accounts held with the settlement bank[6]. At a stipulated time of each working day, the gross settlement obligations for each participant are sent to the settlement bank, for settlement on deferred basis.

The Network for Electronic Transfers (S) Pte Ltd, or NETS, on the other hand, manages the clearing process for the local retail payment systems such as the ATM, EFTPOS and CashCard systems and networks. Obligations arising out of these systems are settled across the accounts held with the settlement bank[7]. NETS advises the multilateral net obligations to the settlement bank for settlement on a deferred basis; for ATM and EFTPOS transactions this will be on a same-day basis, but for CashCard transactions settlement may occur the next day.

Large-value electronic payments are settled within MEPS. MEPS is a real-time gross settlement (RTGS) system developed for large-value Singapore dollar interbank funds transfers and the settlement of scripless Singapore Government Securities (SGS). The main feature of MEPS is the real-time and irrevocable transfer of funds and SGS.

6. Citibank NA.
7. Development Bank of Singapore (DBS).

2.1.2 Payment Methods

2.1.2.1 Cash

As in most countries, currency remains the most accepted means of payment for everyday, low-value transactions in Singapore. Currency notes in circulation today are denominated in SGD1, SGD2, SGD5, SGD10, SGD50, SGD100, SGD1,000, SGD5,000 and SGD10,000. Coins are issued in denominations of SGD0.01, SGD0.05, SGD0.1, SGD0.2, SGD0.50 and SGD1.00.

The Board of Commissioner of Currency, Singapore (BCCS) is given under the Currency Act the sole right to issue currency notes and coins in Singapore. Singapore dollars in circulation are fully backed by a basket of external assets that include gold and foreign currencies.

2.1.2.2 Cheques

Cheques are commonly used in Singapore mainly for low value payments and among local businesses for regular payments for goods and services. There are two types of cheques that can be cleared through the Singapore Automated Clearing House (SACH): SGD-denominated and USD-denominated cheques.

In 2000, 91 million SGD cheques with a total value of SGD435 billion were processed through the SACH.

2.1.2.3 Inter-bank GIRO

The Interbank GIRO (IBG) system allows a customer of a participating bank to transfer funds to another account or many other accounts of other participating banks. It caters mainly for low-value recurring payments and can take place either via direct credits or direct debits transactions. Consumers usually use the IBG system to pay for their public utilities bills, income tax contributions, etc.

In 2000, 30 million IBG payments were processed, with a value of SGD72.1 billion.

2.1.2.4 Payment Cards

a. Credit Cards

All major credit cards are offered in Singapore. The issuance of credit cards is subject to MAS guidelines and regulations, for example on eligibility criteria of cardholders and the marketing of credit cards.

Total credit card transactions amounted to SGD10.5 billion in 2000.

b. Debit Cards

Debit cards can be broadly categorised into two groups: PIN-based debit cards and signature-based debit cards. PIN-based debit cards allow cardholders to make payments or withdraw cash from their deposit accounts through an ATM or EFTPOS terminal. The payment or cash withdrawal is effected through an on-line transfer of funds from the cardholder's account to the beneficiary's account. VISA Electron card and the Debit MasterCard are examples of signature-based debit cards in Singapore.

c. Stored Value Cards

Stored Value Cards (also known as e-money) in Singapore can be categorised into Single Purpose Stored Value Cards (SPSVC) and Multi-Purpose Stored Value Cards (MPSVC). SPSVCs can only be used to pay for goods and services offered by the issuer, for example pre-paid phone cards. In contrast, a MPSVC allows cardholders to pay for goods and services offered by the issuer as well as other merchants or organisations.

Launched in November 1996, CashCard was jointly issued by five local banks[8]. It offers consumers a cashless payment option at a variety of retail outlets. The CashCard can be re-used by topping up its value to a maximum of SGD500 at ATMs, selected EFTPOS terminals and automated kiosks[9] provided by NETS as well as some mobile phones.

8. Development Bank of Singapore, Keppel TatLee Bank, Oversea-Chinese Banking Corporation, Overseas Union Bank and United Overseas Bank. See also footnote 1 and 2.

9. These automated kiosks include CashCard Automated Machines, NETS Kiosks and CashCard Service Terminals.

Besides payment for retail purchases, the CashCard can also be used for payment at carparks, vending machines and payment of toll charges at Electronic Road Pricing (ERP) gantries and the checkpoints between Singapore and Malaysia.

With the incorporation of Visa's stored value mark, Visa Cash and the adoption of the open and non-proprietary Common Electronic Purse Specifications (CEPS), CashCard holders will also be provided with the added convenience of using the card to transact overseas in the near future.

In 2000, the number of CashCard transactions was 100 million with a total value of SGD174 million.

2.1.2.5 Automated Teller Machines

Since their introduction, ATMs have played a major role in promoting a cashless society and in bringing greater convenience to customers. ATMs allow consumers greater ease in making deposits to and withdrawals from their bank accounts. In addition, ATMs also provide other services such as shares applications, third party funds transfers, and bill payments.

As at December 2000, there were 1,787 ATMs in Singapore, representing a penetration rate of about 445 ATMs per million populations.

2.1.2.6 Large Value Funds Transfer

Large value settlement obligations resulting from Singapore banks' activities in the various financial markets, for example money and foreign exchange markets, are settled via interbank funds transfers through the MEPS.

In addition, customers of participating banks can also choose to do funds transfers to customers of other participating banks via the MEPS. Payment via the MEPS is the fastest but costly way of remitting SGD in Singapore.

In 2000, the value of payments made through MEPS was SGD9.6 trillion with a corresponding volume of 1.9 million transactions.

2.1.2.7 Other Access Channels for Payments

a. Telephone Banking

Since the introduction of phone banking in 1982, the range of phone banking services offered has increased. Besides being able to transfer funds and conduct account balance enquiries over the telephone, bank customers can also make bill payments, trade in stocks, and bid for Certificate of Entitlements (COE)[10].

b. Mobile Banking

More recently, bank customers are able to conduct banking transactions through the display screen features of mobile phones. In addition, they can also pay for some online purchases using their mobile phone instead of providing their credit card details over the Internet. One payment method involves the payer pre-registering their credit card account details with their mobile payment service provider. The payer can then make payments using an ID and PIN as authentication and the payment is processed as a traditional credit card transaction. Another method is one that allows the mobile payment to be reflected as another item in the payer's phone bill.

c. Internet Banking

Internet banking allows consumers to conduct account balance enquiries, placements of fixed deposit, as well as demand draft and loan applications. In addition, payment services such as funds transfers (including transfers to third parties' accounts with other banks) and bill payments are increasingly available via the Internet.

A number of banks have also launched Internet payment services that enable consumers to pay for their Internet purchases by directly debiting their bank accounts using their normal Internet Banking systems.

10. To own a motor vehicle in Singapore, a COE is required. COE are awarded based on monthly bidding.

2.1.3 Structure, Operation and Administration

2.1.3.1 The Singapore Automated Clearing House (SACH)

a. Participants

The clearing services of the SACH are only available to members of the Singapore Clearing House Association (SCHA). There are two types of members in the SCHA: ordinary members and associate members. Full direct participation in the clearing services of the SACH is restricted to ordinary members of the SCHA, while associate members can only participate through an ordinary member. All licensed banks in Singapore are eligible to apply for membership in the SCHA.

b. Types of Transactions Handled

The SACH facilitates the clearing of SGD and USD cheques, as well as offline interbank credit/ debit funds transfer instructions.

d. Clearing and Settlement Procedures

i. SGD Cheque Clearing System

The clearing and settlement process of a SGD cheque can is as follows:

- The payer sends a cheque to the payee.
- The payee deposits the cheque at the presenting bank, which credits the payee's account provisionally ("on hold" cheques).
- The presenting bank sends MICR information (ECS data) of cheques to the SACH. For banks sending the ECS data, the corresponding physical cheques can be sent to the SACH later in the day.
- After clearing the cheques determining the net settlement amount for each participating bank, the ACH sends the net clearing figures to MEPS for broadcast and settlement.
- The SACH processes and sorts the ECS data and physical cheques and these are available for collection by the relevant paying banks that evening.

- If the paying bank rejects a cheque, it will return the unpaid cheque to the presenting bank through the SACH by 12:00 the next day.

- The SACH will process the returned cheques and forward them to the respective presenting banks. The settlement amount for both the paying and presenting banks will be adjusted accordingly by the SACH in the figure sent to MEPS that day.

- If the cheque is cleared successfully, the payee can withdraw the "on hold" funds after 14:00 on the second business day.

SACH will transmit the multilateral net positions of all direct and indirect participants to MEPS twice a day on weekdays and once on Saturdays. The cut-off time for transmission of ECS[11] data to SACH for mid-day clearing is 14:30hrs on weekdays (there is no mid-day clearing on Saturdays). Mid-day multilateral net settlement positions are broadcast across MEPS at 15:05hrs and banks have until 15:45hrs to fund any net debit positions whereupon final settlement is effected. For end-of-day cheque clearing, there are two cut-off times for transmission of data to SACH: one for non-ECS physical cheques at 16:00hrs and one for ECS data at 16:45hrs on weekdays (12:30hrs and 13:15hrs, respectively, on Saturdays). End-of-day multilateral net settlement positions are broadcast across MEPS at 17:45hrs (14:05hrs on Saturdays) and banks have until 18:15hrs (14:30hrs on Saturdays) to fund any net debit positions whereupon final settlement is effected.

A deposited cheque will accrue interest from the day it is deposited. However, the funds are not "cleared funds" until the next business day at 14:00hrs in order to provide the collecting bank with sufficient time to be reasonably sure that the cheque will be paid. Cheques are not considered paid until the paying bank has had time to validate the cheque and the drawer's capacity to cover it. Paying banks will only notify collecting banks on an exception basis, i.e. only if the cheque has been dishonoured.

ii. USD Cheque Clearing System

The USD Cheque Clearing System (USD CCS) is the only foreign currency clearing and settlement system in Singapore. The USD CCS, imple-

11. Electronic Clearing System (ECS), see *Historical Background* under the Introduction section of this paper.

mented in 1996, shortened the clearing and settlement cycle for USD cheques of more than two weeks previously to the present three days.

BCS and Citibank N.A. are the appointed clearing agent and settlement bank respectively. For the settlement of USD cheques, participating banks must also maintain USD accounts with Citibank with minimum balances of USD 10,000.

The clearing and settlement process for USD cheques is as follows:

- USD cheques are delivered to ACH by presenting banks.
- BCS generates gross settlement figures to the settlement bank by end of the first day.
- The settlement bank then advises participating banks if there will be insufficient funds in their accounts with the settlement bank, based on a comparison of the total debit position against available funds in the participating bank's account. Participating banks are required to meet any projected shortfall.
- BCS processes and sorts the USD cheques and these are available for collection by the relevant paying banks on the second business day. Settlement occurs on the second business day across participating banks' accounts with Citibank, however the funds are not considered "cleared funds" until the end of day three.
- All returned unpaid USD cheques are delivered to the SACH at the latest by the morning of the third business day.
- BCS processes the returned cheques and the relevant presenting banks collect them by noon on the third business day.
- The customers can withdraw the proceeds after 14:00hrs on the third business day of their deposit.

iii. Interbank GIRO (IBG) System

The IBG system is a paperless system that allows a customer of a participating bank to transfer funds, through direct debits and credits, to the accounts of customers of any participating bank. It currently involves the exchange of magnetic tapes that contain customers' payment instructions through the Singapore Automated Clearing House (SACH)[12]. IBG payments

12. Under the new eGIRO system launched in July 2001, the manual delivery of magnetic tapes between the banks and the SACH will be replaced by an electronic transmission of GIRO items over a secured communication network. See section 4.3 of this paper.

can be broadly separated into two classes according to the type of transfers: Direct Debit Transfers and Direct Credit Transfers.

- *Direct Debit Transfers*

In debit transfers, the payee instructs his bank to collect payment from the paying party often on a recurring basis. Direct Debit payments are pre-authorised by the paying customer, who gives permission to his bank to debit his account upon receipt of instructions initiated by the specified originator. Examples include pre-authorised recurring payments such as utility bills or charges for telecommunication services.

- *Direct Credit Transfers*

In credit transfers, the payer instructs his bank to debit his account and to cause the account of the payee to be credited. Credit transfers are standing order arrangements made by the originator with their bank. The bank then carries out the necessary transfers on a regular specific date, to a specific receiver and for a specific amount. Payroll crediting is the most common direct credit transfer.

The clearing and settlement process for IBG is as follows:

- First Party sends the payment instructions to the Originating Bank.
- Originating Bank checks the credit limit of First Party (if it is a direct credit instruction) and sends the payment instructions to SACH for clearing.
- After determining the net settlement amount for each participating bank, SACH sends the net clearing figures to MEPS for broadcast and settlement.
- The SACH forwards the payment instructions to Receiving Banks for the credit/debit of Second Party's account.
- If payment instruction is rejected, Receiving Banks will return the rejected instruction to the Originating Bank through SACH the next day. SACH will adjust the settlement amount for both banks before forwarding the rejected instruction to Originating Bank.

- If the collection (payment) is successful, a credit (debit) statement is generated for the First Party and a debit (credit) statement for the Second Party.

There is one clearing and settlement session for IBG payment instructions on weekdays and one session on Saturdays. Participants are required to send payment instructions to SACH by 12 noon on weekdays and 9:00hrs on Saturdays. The SACH will send multilateral net settlement positions to MEPS for broadcast to all banks by 15:30hrs on weekdays and 12:15hrs on Saturdays; broadcasts at these times are for information only. The figures are again broadcast at 17:45hrs (14:05hrs on Saturdays) and banks have until 18:15hrs (14:30hrs on Saturdays) to fund any net debit positions whereupon final settlement is effected.

d. Pricing Policies

The SACH adopts a market-based pricing[13] model for the charging of its clearing fees. All related SACH's charges and their subsequent annual reviews are subject to the prior approval of the SCHA committee and notified to all banks.

For the SGD and USD cheque clearing systems, a flat per-item clearing fee is charged to the paying banks under normal clearing conditions. However, both the presenting and paying banks may be subjected to an additional charges under certain conditions, such as the presence of rejected or returned items, late submission of clearing items, and the subscription to other value-adding services provided by the SACH.

Under the new eGIRO system, the SACH charges the originating banks a flat per-item clearing fee for the first 300,000 items it receives under normal clearing conditions. A discounted flat per-item clearing fee applies for any subsequent items received. Similarly, additional charges may apply to both the originating and receiving banks under certain conditions, such as the presence of returned items or the use of other optional SACH services.

13. As defined in BIS's *Core Principles for Systemically Important Payment Systems*, market-based pricing means that prices are typically charged on a per transaction basis and would include total costs plus a surplus, which is determined by competitive market conditions or by appropriate return-on-capital considerations.

2.1.3.2 Network for Electronic Transfers Singapore Pte Ltd (NETS)

a. Participants

Participants in the NETS' clearing services for EFTPOS, ATM and CashCard transactions are currently the shareholding banks only.

b. Types of Transactions Handled

NETS facilitates the clearing of debit card and CashCard transactions conducted at the Point-of-Sale, as well as for interbank ATM transactions by providing the switching to channel transaction data and customer security information to the relevant banks' systems for proper approval.

c. Clearing and Settlement Procedures

i. NETS Point-Of-Sale (POS) Systems

POS transactions acquired on NETS terminals are routed to NETS for processing. The routing arrangements will vary depending on the card type used in the transaction:

- For debit cards issued in Singapore, NETS dispatches the transaction for authorisation to the issuing bank. The issuing bank verifies the PIN, checks that sufficient funds are available, verifies that the transaction is not fraudulent and authorises the merchant to deliver the good/services and debits the cardholder's account.

- For Maestro cards and Amex and Diners charge cards, NETS routes the transaction to the card processor according to the branding. The card processor, on behalf of the issuing bank, checks the payment limit, verifies that the transaction is not fraudulent and authorises the merchant to deliver the good/services.

- For CashCard transactions, the CashCard POS terminal will deduct the purchase amount from the pre-paid amount stored in the card. At the end of the day, retail outlets accepting CashCard payments will transmit the day's transactions to NETS for processing.

POS transactions are settled across accounts held with the NETS' settlement bank[14]. NETS clears local debit cards and CashCard transactions and the settlement occurs via debiting/crediting of the banks' accounts with DBS.

NETS first performs multilateral netting to determine a net settlement amount for each member bank.

The net amount is then submitted to the settlement bank for direct debiting/crediting of the member banks' accounts.

Member banks then manage their nostro accounts at the settlement bank through MEPS.

ii. ATM Networks

Most banks in Singapore have proprietary ATM networks, however there are linkages between these networks providing consumers with wider access to the machines. There are currently two major ATM networks in Singapore:

- The POSB-DBS ATM network, which was established following the merger of POSBank and the Development Bank of Singapore Ltd (DBS) in 1998. This network is a proprietary based network; and

- The ATMNETS network, a shared ATM service among the other four local banks (United Overseas Bank, Oversea-Chinese Banking Corporation, Overseas Union Bank, Keppel-Tat Lee Bank)[15]. In November 2000, these four banks announced plans to consolidate their offsite ATMs under a new entity called ACENET. ACENET will market and manage ATM services for an integrated off-site ATM network. Its implementation is expected to lead to cost savings through economies of scale for the participating banks. It will provide operational and technical services such as ATM cash replenishment, machine maintenance, upgrade of the network as well as the development of infrastructure and other ATM related services.

14. Development Bank of Singapore (DBS).

15. See footnotes 1 and 2.

For transactions using the ATMNETS network, the switching is done by NETS. When a cardholder performs a transaction at an ATM of another bank, NETS switches the transaction to the issuing bank for authorisation, which involves verification of the PIN, checking that sufficient funds are available and the authentication of the transaction. The issuing bank then sends its response back via NETS, which switches it to the ATM being used, and the transaction is completed.

If cardholders perform transactions at their own bank's ATM, these do not require any switching, as the issuing bank is able to directly approve them.

ATMNETS transactions are cleared by NETS. NETS calculates the multilateral net settlement positions for each member bank. The net amount is then provided to DBS for direct crediting/ debiting of the member banks' accounts with DBS. Member banks then manage their nostro accounts at DBS through MEPS.

Cirrus and Plus transactions are cleared by Mastercard and VISA respectively on a similar principle to NETS. When currency conversions are necessary, the London interbank rate is used. Settlement for these transactions is conducted through the respective card schemes' bankers.

d. Pricing Policies

NETS adopts a market-based pricing[16] model towards the participating banks. For its EFTPOS services, charges are levied on the issuing banks, whereas for its interbank ATM switching services, NETS' charges apply only to the acquiring banks. NETS' charges for both the abovementioned services are based on a volume-based graduated per-transaction fee structure. In addition, the issuing banks pay acquiring banks a flat per-transaction ATM interchange fee.

2.1.3.3 Real-Time Gross Settlement System - MAS Electronic Payment System (MEPS)

a. Participants

All banks in Singapore are eligible to participate directly in MEPS. However, banks with a small volume of SGD payments may choose to ap-

16. See footnote 6.

point a participating bank as their agents to make SGD interbank payments on their behalf. To do so, non-participating banks may enter into private agency agreements with any of the participating banks. The terms of such agreements are bilaterally negotiated between the banks, and are outside the ambit of the MEPS.

b. Types of Transactions Handled

MEPS is designed to allow large-value SGD interbank funds transfers and to settle scripless Singapore Government Securities (SGS) on a delivery-vs-payment (DvP) basis. In addition, it also maintains a real-time system link to the Singapore Exchange (SGX) Debt Securities Clearing and Settlement System (DCSS) for the settlement of listed SGD corporate debt securities on a DvP basis.

c. Clearing and Settlement Procedures

MEPS consists of two subsystems namely, MEPS Interbank Funds Transfer (MEPS-IFT) subsystem and MEPS Singapore Government Securities – Delivery Vs Payment (MEPS-SGS) subsystem.

i. MEPS-IFT Sub-system

Under the MEPS-IFT sub-system, interbank funds transfers are made using MEPS messages, derived from SWIFT standards. Banks' current accounts held with MAS are structured to facilitate RTGS payments. Within each current account, there are two sub-accounts: the reserve account and the RTGS account. The banks' intraday Minimum Cash Balances (MCB) requirement[17] is maintained in the reserve account. Funds exceeding the intraday MCB requirement in the reserve account are transferred at the start of the day to the RTGS account, where they may be used for the settlement of MEPS payments. On an intraday basis, bank may also draw down the full MCB amount in their reserve account to make payments.

Each participating bank has a front-end system, which is linked to the central host computer at MAS. The front-end system allows a bank to perform data entry, submit payment instructions and make online account en-

17. Under Section 40 of the Banking Act, all banks in Singapore are required to maintain MCB with MAS of not less than 3% of total liabilities.

quiries. Submitted payment instructions that are not able to settle due to insufficient funds in a bank's account are queued with an assigned priority by the participating bank. All queued instructions will then be settled in accordance to their assigned priority levels on a first-in-first-out (FIFO) basis. The queuing mechanism has the following levels of priority:

- 1 - MAS transactions
- 2 - Cheque/Interbank GIRO (IBG) transactions
- 3 - Banks' urgent transactions
- 4 - SGS transactions
- 5 - Banks' normal transactions
- 9 - Banks' payments on hold

Participants are only able to re-prioritise payments at priority levels 3, 5 or 9. By moving these payments from one of these priority levels to another, banks can effectively determine the settlement sequence of their payments. To illustrate, a bank may not have sufficient balance to settle a priority 3 payment, but has enough to settle its other priority 5 payments. In this case, all priority 5 payments will not settle until the priority 3 payment is settled. Alternatively, the bank may place the priority 3 payments on hold with a priority 9, and then its priority 5 payments can be settled first.

MEP-IFT only processes same-day value transactions. However, the system also accepts forward-dated transactions up to two working days in advance. Such transactions will be stored in the host database and are only processed on the actual value date.

The operating hours of the MEPS-IFT sub-system are between 09:00hrs to 18:30hrs on Mondays to Fridays, and between 09:00hrs to 14:45hrs on Saturdays.

ii. MEPS – SGS Sub-system

The MEPS-SGS facilitates the instantaneous and irrevocable transfer of SGS both on a DvP basis and a FOP basis, i.e. a transfer of SGS without a corresponding funds transfer instruction.

When MEPS-SGS is operating on the DvP mode, fund transfers and securities delivery occurs simultaneously on a real-time basis. Clearing and settlement of SGS transactions is accomplished electronically on a Deliv-

ery-vs-Payment (DvP) basis over the MAS Electronic Payments System (MEPS) and MAS' SGS book-entry clearing system.

Participating banks of MEPS need to maintain two accounts in the MEPS-SGS sub-system:

- SGS-MLA Account
  To maintain SGS for compliance to the Minimum Liquid Assets (MLA) requirements[18].

- SGS-Free Account
  To maintain any excess SGS holdings to the minimum MLA requirements.

Banks can only sell SGS in the SGS-Free account. Transfers of SGS from MLA account to SGS-free account can only be carried out if the value of the remaining SGS in the SGS-MLA account is equal to or exceeds the prudential requirement of 10% of liabilities. Otherwise, such transfers will be rejected by the system.

If the seller of SGS has insufficient SGS for delivery, the transaction is queued until there are sufficient SGS in the seller's SGS-Free account. The SGS would be earmarked for transfer to the buying bank and an IFT payment message would be sent to the MEPS.

If the buying bank has insufficient funds to pay for the SGS purchase, the payment is queued. When the funds become available, the amount is debited from the buyer's RTGS account and credited to the seller's RTGS account. The MEPS-IFT sub-system will then simultaneously notify the MEPS-SGS sub-system to transfer the securities irrevocably to the purchasing bank.

Non-MEPS participating banks can also receive funds and SGS in their MAS current accounts and SGS-MLA accounts, respectively, to facilitate adjustment of the balances in their MAS Current accounts or SGS-MLA accounts for MCB or MLA purposes. Funds transfers from participating

18. Under Banking Act Chapter 19, all banks in Singapore must maintain MLA of not less than 18% of total liabilities, of which at least 10% must be kept in Singapore Government Securities (10% SGS includes both outright holdings of SGS as well as those held under reverse repo transactions).

banks to non-participating banks would be credited directly to the non-participating banks' MAS Current accounts, while SGS issues would be credited into such banks' SGS-MLA accounts. However, participating banks may only make SGS transfers to non-participating banks on a FOP basis.

d. Pricing Policies

Participating banks are charged on a cost recovery basis. A flat fee is charged for each message submitted, payable by the bank initiating the MEPS message. There is no annual subscription fee or admission fee to participate in MEPS, and no additional charge for real-time current account balance enquiries.

e. Risk Management

To minimise settlement risks, MAS extends short-term intraday credit to banks and allows banks to use the full amount of their reserves on an intraday basis. The intraday credit from MAS has to be collateralised with SGS and are extended through primary dealer banks. There is currently no charge for their use.

An end-of-day facility is also provided to allow banks to borrow SGD funds from the MAS via overnight repurchase transactions (repos) of SGS. The interest rate to be charged on the overnight repurchase transaction will be 2% above the reference rate. The reference rate is the 1-month SGD SIBOR fixed by the Association of Banks in Singapore (ABS) at 11:00hrs Singapore time on the same working day.

In terms of mitigating operational risks, MEPS deploys stringent front-end application user security mechanisms, digital signatures and encryption technologies to ensure the integrity, confidentiality and authenticity of the payment messages. Business continuity and disaster recovery plans are established and regularly tested for the MEPS host system as well as the participants' front-end systems. In addition, the MEPS host and participants' front-end systems are subject to periodic operational and technical audits by MAS' Internal Audit Department (IAD) and the MAS' bank examiners respectively.

2.2 Cross Border Payments

Cross border payments refer to payments that involve foreign currencies and/or payments made to overseas destinations. The need for cross border payments usually arises from the settlement of financial transactions where foreign currencies are involved, such as foreign exchange transactions. Cross border payments can also arise from the banks' customers requesting to make overseas remittances. There are various remittance options available to the customers, with the more common ones being demand drafts (DD) and telegraphic transfers (TT). TT is currently the fastest way of remitting funds to and from overseas, and funds remitted will be credited directly to the beneficiary's account.

In the majority of cases in Singapore, a bank's cross border payments are usually executed using nostro account services provided by its networks of correspondent banks, or via its overseas branches. Depending on foreign currencies involved, the bank will send payment orders and other settlement instructions to the respective correspondent banks or overseas branches, authorising them to settle their payment obligations on its behalf. Normally, such payment orders are sent via the SWIFT network. To make use of the messaging services provided by SWIFT, a bank has to become a member of the network. Banks that are non-SWIFT users will likely use tested telexes[19] for executing their payment obligations.

3. Implications of the Existing Payment and Settlement Systems for Financial Stability

3.1 Monetary Policy

3.1.1 Monetary Policy Strategies and Objectives

Since 1981, the MAS has been pursuing an exchange rate-centered monetary policy strategy. There are no independent targets for the domestic interest rates or monetary base. The final objective of the exchange rate policy is to promote price stability, or low stable inflation, as the sound basis for sustainable economic growth.

19. Tested telex is one, which is authenticated by the sender to ensure the security and authenticity of the message.

The Singapore dollar (SGD) is managed against a trade-weighted basket of currencies of Singapore's major trading partners and competitors. The MAS operates a managed-float exchange regime for the SGD. In other words, there is no official peg for the value of the currency against any other currency or basket of currencies. Instead, it is allowed to fluctuate within an undisclosed policy band. The policy band is usually reviewed every 6 months to ensure it reflects the current underlying fundamentals of the economy. Regular review of the policy band allows the MAS to continually assess the path of the exchange rate in order to avoid a misalignment in the currency value, and also gives the MAS the flexibility to accommodate short-term volatility in the financial markets.

To smooth out short-term fluctuations and to avoid misalignment of the SGD exchange rate, the MAS intervenes in the foreign exchange market from time to time. MAS usually engages in transactions that involve the sale or purchase of US dollars against the SGD. The policy band provides a certain amount of flexibility, which minimises the need for constant intervention. However, the buying and selling of US dollars against the SGD will have an impact on the liquidity in the banking system. To manage the liquidity in the banking system, MAS also conducts money market operations to ensure there is an appropriate level of liquidity in the banking system. The money market instruments used include foreign exchange swaps or reverse swaps, direct lending to or borrowing from banks, repurchase (repos) or reverse repurchase (reverse repos) agreements in Singapore Government Securities (SGS) and direct purchase or sale of SGS.

3.1.2 Payment Systems and Monetary Policy Implementation

The ability of the MAS to implement monetary policy and effectively regulate the supply of SGD liquidity in the banking system relies on the availability of a reliable, robust and efficient technological and institutional framework, or transmission mechanism. Singapore's RTGS system, MEPS, is the interbank payment system through which MAS carries out its monetary operations, and to this extent, it is important that the system is designed and operated in such a way that it does not create unanticipated or unnecessary delays or difficulties for MAS to achieve its monetary policy objectives.

Changes in specific design aspects of the payments system can give rise to implications for the conduct of monetary policy, for example, changes in payments system aimed at reducing float or settlement cycles may affect

the transmission mechanism and MAS' planning of its money market operations. MAS is acutely aware of this close linkage between the payment system and its monetary operations and ensures that any changes to the payment system are pursued in a coordinated and complementary manner to monetary policy implementation processes.

The following section describes particular examples of how specific aspects of the large-value interbank payment system in Singapore both facilitates and impacts on the implementation of MAS' monetary policies.

3.1.3 MEPS

The MAS Electronic Payment System (MEPS) is a large-value interbank funds transfer system, which allows transactions to be settled on a real-time, gross and irrevocable basis across settlement accounts with MAS. MEPS replaced MAS' previous end-of-day net settlement payment system (SHIFT), thereby greatly reducing the settlement risks inherent in domestic interbank financial transactions, including MAS' money market transactions. In addition, MEPS provides real-time information/data on liquidity flows resulting from the transactions in the inter-bank money market, enabling MAS to identify any unusual behaviour that may impact on the smooth operation of the financial system.

Singapore banks are required to maintain a Minimum Cash Balance (MCB) (3% of banks' deposit liabilities), which they maintain in a dedicated settlement account in MEPS. Banks are required to meet their MCB requirements daily, although they can use the reserves for RTGS settlement purposes during the day. This MCB requirement forms an important consideration for determining the level of liquidity that MAS needs to maintain in the banking system.

As MEPS is a real-time gross settlement (RTGS) system, there may be an increase in demand for settlement balances throughout the day (intraday liquidity) arising from large payment flows that may occur from time to time. Such payment flows may exceed banks' ability to pay at a particular point in time, given that they are not allowed to incur negative balances in their RTGS settlement accounts. Such a demand for liquidity can lead to payment gridlocks in an RTGS system, which may bring the entire payment system to a standstill and affecting MAS' and the banks' financial transactions.

In response, MAS will extend intraday credit where necessary to resolve any systemic payments gridlock. Such credits are extended through primary dealer banks and must be collateralized with SGS. However, it is important that this intraday liquidity is repaid the same day to minimise the impact on overnight monetary conditions. To minimise the possibility of intraday repos "spilling over" into overnight loans, MAS applies high interest penalties to any un-repaid intraday credit.

3.2 Payment System Oversight

3.2.1 Payment Systems Objectives

Payment systems are an integral component of the infrastructure of the economy, especially for the financial sector, allowing economic agents to transfer money between one another to allow completion of transactions. In addition, payment systems form a critical component of the transmission mechanism that MAS uses to conduct its monetary policy operations. Thus, any disruptions or failures in the payment systems can impact on monetary and financial stability, and on the overall smooth functioning of the economy in general. MAS oversees the payment systems with the objective of ensuring that they are designed and operated in a safe and sound manner.

MAS is also concerned with ensuring that payment systems are, and remain, efficient, effective and progressive. The aim of this second objective is to ensure that payment systems respond effectively to the changing payment needs of the user communities in the face of rapid financial liberalisation and economic globalisation.

3.2.2 Payment Systems Oversight in Practice

3.2.2.1 Oversight Role in the Payment System

The legislative basis for MAS's oversight activities for payment systems and instruments are included in the Banking Act. This Act has specific provisions concerning RTGS systems (MEPS), the SACH (cheques and inter-bank GIRO clearing) and multi-purpose stored-value cards (MPSVC). MAS sets out the framework policies, issues recommendations, and develops and approves the regulations and rules governing the participants and the terms of use for the payment systems.

For instance, in the case of the MAS Electronic Payment System (MEPS), which as the only large value funds transfer system for the financial sector, presents significant financial risks to its participants and can be a channel where disruptions in one area of the economy or financial sector can be transmitted to another. MAS, as the overseer, owner and operator of MEPS, determines the rules of participation in MEPS and supervises the payment activities of the participants through its inspections of supervised entities in the financial sector. In addition, MEPS is subjected to regular independent audits and MAS oversees its overall strategic development. Moreover, MAS actively consults with the participants of MEPS on issues concerning the operational effectiveness and efficiency of MEPS, so as to ensure that MEPS can continue to deliver payment services that meet the participants' needs.

For other payment systems or instruments where no explicit regulatory powers apply, for instance the NETS retail EFTPOS and ATM systems and networks, MAS exercises its oversight influence over how the service providers conduct their payment-related activities through the banks, which are either the participants or stakeholders of those systems. Often, MAS relies on its good working relationships with the system participants and stakeholders, and through effective moral suasion, to achieve its payment system objectives.

3.2.2.2 Institutional Structure

MAS has a cross-departmental multi-disciplinary committee that meets to discuss issues related to the payment and settlement systems in Singapore. This forum facilitates information sharing between the different departments, especially between those involved in the supervision of banks and financial institutions and those performing oversight of payment systems, for effective decision-making. This Committee is also responsible for overseeing the securities settlement systems, and is represented by several MAS' senior management personnel.

3.2.2.3 International Cooperation

MAS is an active member of the global Committee for Payment and Settlement Systems (CPSS) under the auspices of the Bank of International Settlements (BIS). The committee provides a forum for central banks to monitor and analyse developments in domestic payment, settlement and

clearing systems as well as in cross-border and multi-currency settlement schemes[20].

Recently, CPSS developed and published a report ("Core Principles for Systemically Important Payment Systems") that outlined a set of best practices designed for use by central banks to assess the safety and efficiency of their own payment systems. MAS was involved in the formulation of the report and is currently assessing the compliance of MEPS with those principles.

In addition, MAS is also a member of the Workgroup on Payment and Settlement Systems under the Executives' Meeting of East Asia-Pacific Central Banks (EMEAP)[21]. The workgroup was formed with the objective of studying the developments of domestic and cross border payment and settlement systems.[22]

3.3 Competition/ Innovation

3.3.1 Introduction

MAS regulatory oversight seeks to ensure payment systems operate in a safe and efficient manner, which is consistent with its broader policy objective of promoting financial system stability. At times, these objectives of safety and efficiency may require delicate balancing. For example a payment system that has low barriers to entry may be ideal, as it would attract many participants thereby increasing the competition and efficiency of the system. However, such a system may be susceptible to instability due to the risks created in the system by participants lacking the financial resources and the necessary technical and operational expertise.

MAS' oversight arrangements seek to balance the objectives of safety and efficiency. For payment systems where MAS has explicit regulatory powers, the setting of the access criteria can be a useful tool for MAS to ensure the safety and stability of the systems. However, at the same time,

20. BIS website at www.bis.org.

21. EMEAP is a cooperative organisation of central banks and monetary authorities in the East Asia and the Pacific, with the primary goal of strengthening the cooperation between its members.

22. EMEAP website at www.emeap.org

the access criteria can be defined in such a way that it also ensures that systems can also operate in an environment that does not stifle innovation, which may result in more efficient payment systems. For those payment systems where no explicit regulatory powers apply, MAS can exercise its oversight indirectly through banks or governing bodies established by banks.

The sections below examine in greater detail the way access criteria has been applied to the payment systems in Singapore. Three payment systems, namely MAS Electronic Payment System (MEPS), the Singapore Automated Clearing House (SACH) and the NETS EFTPOS will be considered here.

3.3.2 Access Criteria Implementation

3.3.2.1 MEPS

MAS is given explicit powers under the Banking Act (Section 59A) to establish and operate one or more real-time gross settlement system to settle payment and book-entry securities between and among participants approved by MAS. MEPS is the only large-value payment system established by the MAS for inter-bank transactions in Singapore. This reflects the view that only one such system is necessary, considering the size of Singapore's financial system and the considerable economies of scale such LVTS require.

Full direct participation in MEPS is open to any licensed-bank operating in Singapore, with no prescribed admission or membership fee. However, any banking institution that intends to operate as a bank in Singapore has to meet stringent risk-based prudential requirements. This entry criterion serves to limit the participation in MEPS only to institutions that have the necessary financial resources and technical and operational expertise, thereby limiting the level of risks created in the system.

Once a licensed bank decides to join MEPS, they need only invest in a front-end system provided by an external vendor and subscribe to a dedicated data communications line to connect to the central host computer in MAS to start their participation in MEPS. However, banks can choose not to invest in the required hardware and software by participating indirectly in MEPS. Such banks enter into a private contractual relationship with a direct participant, who will settle their interbank obligations on their behalf.

3.3.2.2 The Singapore Automated Clearing House (SACH)

Under the Banking Act (Section 59), MAS has the authority to establish, in conjunction with banks and other financial institutions, a clearing house to facilitate the clearing of cheques and other credit instruments.

MAS, together with the industry, set up the Singapore Clearing House Association (SCHA), which subsequently established the SACH for the clearing of cheques and inter-bank GIRO instructions for the financial industry. Banking Computer Services (BCS) Pte Ltd, a private entity, has been the operator of the SACH since 1981. MAS awarded BCS with the contract to set up and operate the SACH through an open tender process. The open tender is held every five years.

The SCHA is managed by a management committee comprising of 7 members, and 4 of which are elected members of the association. MAS is represented by two appointed individuals in the committee. MAS' representation will enable it to have some influence over the decisions taken by the association that may affect the general public and other related parties more generally. There are two types of members in the SCHA: ordinary members and associate members. Full direct participation in the clearing services of the SACH is restricted to ordinary members of the SCHA, while associate members can only participate through an ordinary member. All licensed banks in Singapore are eligible to apply for membership. The management committee will determine the outcome of all membership applications, and all new ordinary and associate members are required to pay a one-time nominal fee.

As members of SCHA are also its customers, it is in their own interests to improve the SACH's operating efficiency. Since the SACH commenced its operations, the SCHA has made significant improvements to the efficiency of the clearing process through the adoption of new innovative technologies. Examples include the deployment of the Electronic Clearing System (ECS) capability, electronic cheque Imaging Clearing System (ICS) and the eGIRO system.

3.3.2.3 NETS EFTPOS

NETS, or the Network for Electronic Transfers Singapore Pte Ltd is a private sector business venture owned by five local banks[23] in Singapore. Currently, only the shareholding banks are participating in the clearing services of NETS.

The most recent MAS' banking liberalisation measures announced in June 2001 are likely to result in significant changes in the EFTPOS payment landscape within the next few years. Under the liberalisation measures, foreign banks are now able to negotiate access to the existing EFTPOS payment systems and networks, or establish their own systems and networks starting from July 2002.

In the meantime, NETS continues to develop new and innovative payment solutions that meet the demands of both retail customers and merchants. For example, NETS recently tied up with a technology vendor to offer JanusX, an online direct debit payment solution that allows consumers to pay for their internet purchases by directly debiting their banking accounts. NETS consults with MAS on all such initiatives, and in this way MAS ensures that business decisions taken by NETS are in accordance with the broader strategic policy decisions to ensure the safety, stability and efficiency of Singapore's retail payment systems.

4. Consumer Protection

4.1 Introduction

Consumers are exposed to different types of risks when using the different forms of retail payment services available in the market. The primary risks include the unauthorised use of or access to the payment instrument or services, payment processing errors or malfunctions, and dishonouring or default of the issuer or payor.

Consumers have incentives and responsibilities to protect themselves against the risks whenever possible by, for example, safeguarding their payment cards and Personal Identification Number (PIN) to prevent unauthorised access to their accounts. Payment service providers also have incentives to mitigate their customers' risks in order to market their products bet-

23. See footnote 1.

ter by, for instance, developing industry standards and adopting best practices.

However, as a result of asymmetric information between banks and their customers there is often a role for public policy intervention to ensure appropriate consumer protection measures are in place, and that consumers have access to avenues where they can seek redress or attempt conflict resolution. Such publicly provided mechanisms are less time-consuming and costly for the consumer compared to private actions (e.g. civil legal action). This section examines the consumer protection measures and mechanisms established by the banking industry as well as the government authorities.

4.2 Consumer Protection Mechanisms and Measures

4.2.1 Role of the MAS

While consumer protection is currently not an explicit objective of the MAS, its current regulation and supervision framework for the financial system is directed at ensuring banks and other financial institutions operate in a safe and efficient manner, which would not compromise the interests of their customers. For instance, MAS recently released the Internet Banking Technology Risk Management Guidelines[24] and will be monitoring the banks' compliance with those guidelines. It is also recognised that the provision of payment services is essentially based on private contractual relationships between the banks and the consumers, and should any disputes arise between these parties, they should, as the first step, seek to resolve the issues among themselves.

4.2.2 ABS Code of Conduct for Banks

The Association of Banks Singapore (ABS) has an established code of conduct for banks. The purpose of the code is to "set out standards of good banking practice and to maintain confidence in the security and integrity of the banking system, and ensure a fair relationship between banks and their customers".[25] The code outlines a set of best practices that serves as a guide for the banks when marketing and selling their products and serv-

24. Guidelines available at MAS' website at www.mas.gov.sg.

25. Association of Banks Singapore (1993)

ices to their customers. In particular, the code outlines best practices pertaining to information disclosure about banks' terms, conditions, charges, fees, service level expectations, etc., handling of customers' complaints, compensation, protecting customer data confidentiality, responsible advertising, and others. Banks are encouraged to develop or review their internal operating guidelines in accordance with the code.[26] In addition, ABS is currently formalising a separate Interbank GIRO (IBG) Charter that outlines best practices standards for the banks providing IBG services as well as the billing organisations in their relationships with consumers.

4.2.3 Consumers' Association of Singapore (CASE)

CASE is an independent non-statutory organisation, established in 1971, which provides advice to consumers and assists them in seeking redress for a wide range of consumer issues. CASE also works to promote the awareness of consumer protection issues, conducts market-pricing surveys and represents consumers in national committees dealing with consumer protection concerns, policies and legislation. CASE encourages consumers, who think they may have been treated unfairly by service providers, to first lodge a complaint with the service provider, and to only approach CASE when the service provider fails to address their grievances. CASE will then raise the complaint with the alleged service providers.

5. Recent Payment System Developments and Policy Initiatives

5.1 Electronic Legal Tender (ELT)

Today in Singapore, only currency notes and coins are legal tender. As cashless forms of payment become more widespread, the Board of Commissioner of Currency, Singapore (BCCS) is looking into the need to legislate for electronic payments to be also given legal tender status. Merchants covered by the legislation must then accept electronic payment if tendered. BCCS is actively studying this issue and has announced that it intends to issue Electronic Legal Tender in 2008.

26. Association of Banks Singapore (1993)

5.2 Banking Liberalisation Programme

In May 1999, MAS announced a five-year programme to liberalise commercial banking in Singapore. The programme included a package of new banking privileges and licences for foreign banks, to be granted over three years from 1999 to 2001. One significant liberalisation measure is the awarding of new Qualifying Full Bank (QFB) status to foreign banks. The QFB privileges included allowing the foreign banks to establish additional banking branches and ATMs, as well as to share ATMs among themselves.

In June 2001, MAS unveiled the second phase of the banking liberalisation programme that would further open up the banking industry to competition. One of the measures announced under the second phase is to permit QFBs to provide debit services through an EFTPOS network from July 2002 onwards. QFBs will be able to negotiate with NETS, Visa or MasterCard for access to their systems and networks.

5.3 eGIRO

In July 2001, the SACH upgraded its existing interbank GIRO system to a browser-based eGIRO system. The enhanced system will eliminate the manual delivery of magnetic tapes between the banks and the SACH by allowing the participating banks to send and receive GIRO items, including returned and rejected ones, electronically via a secured communication network. Under the new eGIRO system, the clearing and settlement cycles for the direct credit and debit transactions can be shortened significantly. In addition, this new system also acts as another underlying payment infrastructure capable of supporting new e-payment initiatives in the industry.

5.4 FX Settlement Risk Practices Survey

MAS released in July 2001, a report on the FX settlement risk practices among foreign exchange participants in Singapore. The report is the result of a survey conducted by the MAS on settlement practices of the major participants in the Singapore foreign exchange market. The survey is conducted as part of MAS' overall efforts to reduce the level of foreign exchange settlement risk in Singapore. The report, which included recommendations for reducing foreign exchange settlement risk, is expected to further increase industry awareness and to move the industry towards adopting international best practices in this area of risk.

5.5 Cheque Truncation

The banking industry, in conjunction with the Singapore Clearing House Association and the Association of Banks in Singapore, is developing a Cheque Truncation System (CTS) targeted for implementation in 2002. The CTS eliminates the movement of paper cheques between the SACH and the participating banks by capturing electronic images of cheques at the point of deposit and transmitting them for verification throughout the entire clearing process. The implementation of the CTS is expected to deliver cost savings and quicker processing cycles.

6. Recommendations on the Role of Central Bank in Ensuring the Safety and Efficiency of the Payment and Settlement Systems

MAS should consider including the central banks' responsibilities as outlined in the CPSS'[27] "Core Principles for Systemically Important Payment Systems"[28] paper as part of its existing payment oversight activities to promote the safety and efficiency of the Singapore's payment system. The adoption of the responsibilities is consistent with MAS' payment system objectives, and a number of MAS' current initiatives can be seen as fulfilling those four responsibilities. For example:

- A self-assessment of the MEPS against the Core Principles is currently being carried out to determine the level of compliance of MEPS. The MEPS is considered a systemically important payment system in Singapore and is owned and operated by the MAS. Complying with the Core Principles will ensure that MEPS meets the current best practices of safety and efficiency. MAS should not only continue to work towards this objective for MEPS, but should also apply the Core Principles, or relevant aspects of it, to other payment systems with system-wide impact.

- A study on the need for a more formalised approach towards payment system oversight is in progress. It is stated under Responsibility A of the Core Principles that "the central bank should define clearly its payment system objectives and should disclose publicly its role and ma-

27. Committee on Payment and Settlement Systems of the BIS.

28. The core principles and central banks' responsibilities are shown in Annex A and B.

jor policies with respect to systemically important payment systems", as this would "give a degree of assurance to the private sector that the policy environment will be predictable, encourages behaviour by the private sector that is consistent with the stated policy, and provides a foundation for investment in payment systems." Formally legislating the MAS' objectives for and roles in the payment system, and publicly disclosing its major policies it will follow to achieve those objectives is one example of satisfying Responsibility A.

- Preparations for the inclusion of the Singapore dollar into the Continuous-Linked Settlement (CLS) initiative have already started. This initiative will greatly reduce the settlement risks inherent in cross border currency trades by allowing trade settlement to take place on a payment-vs-payment (PvP) basis. MAS should continue to facilitate and provide support wherever necessary for the successful and timely inclusion of the SGD as a CLS-currency.

Country Tables

Table 1: Major Events Affecting the Payment and Settlement Systems

Date	Major Developments
1979	First ATM installed in Singapore.
1982	ACH commenced its operations for the clearing of SGD cheques
1984	Interbank GIRO system implemented by the ACH.
1985	SHIFT, the large-value interbank net settlement system was implemented. NETS EFTPOS services were launched.
1988	ATMNETS, the shared ATM service was launched.
1996	NETS CashCard was introduced. USD cheque clearing system was implemented.
1998	MEPS, a RTGS payment system, replaced SHIFT as the large value interbank funds transfer system.
2000	ACENET was formed.
2001	Cash-back service was introduced.

Table 2: Selected Country Indicators

	1995	1996	1997	1998	1999
Population (million persons):					
Mid-year	3.53	3.67	3.79	3.92	3.95
GDP (SGD millions)	117,768	128,201	140,228	137,464	142,111
GDP per capital (SGD)	33,404	34,928	36,963	35,040	35,958
Exchange Rate (SGD against USD):					
Year-end	1.4143	1.3998	1.6755	1.6605	1.6660
Average	1.4174	1.4101	1.4848	1.6736	1.6949

Table 3: Settlement Media used by Non-banks (SGD millions)

	1995	1996	1997	1998	1999
Total notes and coins in circulation	10,756	11,276	11,733	11,338	14,209
Transferable deposits[1]	17,538	18,863	18,297	18,427	21,676
Narrow money supply (M_1)	25,349	18,863	18,297	18,427	21,315
Memorandum item:					
Broad money supply (M_3)	136,737	148,494	160,766	173,581	186,184

[1] Demand deposit of non-banks' customers.

Table 4: Settlement Media used by Banks (SGD millions)

	1995	1996	1997	1998	1999
Reserve balances held at central bank	6,472	7,095	7,702	5,431	7,524

Table 5: Institutional Framework (end-March 1999)

Categories	Number of Institutions	Number of Branches	Number of Accounts	Value of Accounts
Central bank	1	1	•	•
Commercial banks:		561		
Local	12		•	•
Foreign	128		•	•
Merchant banks	70	70	•	•
Finance companies	15	109	•	•

Table 6: ATMs and EFTPOS Terminals

	1995	1996	1997	1998	1999
ATMs:					
Number of networks	2	2	2	2	2
Number of machines	1,698	1735 [1]	1,894	1,893	1,855
Volume of transactions[2]	12,100,000	13,800,000	15,200,000	15,500,000	10,100,000[3]
Value of transactions[2]	2,500	3,000	3,400	3,500	2,400[3]
EFTPOS:					
Number of networks	1	1	1	1	1
Number of machines	11,462	13,083	15,002	16,034	17,804
Volume of transactions	34,548,000	42,388,000	50,855,000	57,897,000	65,740,000
Value of transactions	2,125	2,786	3,444	3,531	4,100

[2] Interbank ATM transactions only. [3] Drop in interbank ATM transaction volume and value due to DBS Bank's withdrawal from the ATMNETS network when DBS Bank acquired POSBank.

Table 7: Number of Payment Cards in Circulation

	1995	1996	1997	1998	1999
Cards with cash function (i.e. CashCard)	• [1]	151,094	683,304	2,192,933	3,463,902
Cards with debit/credit function of which:					
Debit cards[2] (ATM cards)	2,616,775	2,824,010	2,955,580	3,013,727	3,177,168
Credit cards	6,164,042	6,594,825	7,211,566	7,880,071	8,586,839

[1] CashCard was introduced only in December 1996. [2]Figures based on survey data from 8 banks (DBS, UOB, OUB, OCBC, KTL, HSBC, Standard Chartered and BNP).

Table 8: Payment Instructions handled by Selected Payment Systems - Volume of Transactions

	1995	1996	1997	1998	1999
Large Value: SHIFT/ MEPS [1]	1,434,877	1,543,693	1,803,985	1,875,520	1,866,478

[1] SHIFT replaced MEPS in July 1998.

Table 9: Payment Instructions handled by Selected Payment Systems - Value of Transactions (SGD billions)

	1995	1996	1997	1998	1999
Large Value: SHIFT/ MEPS [1]	6,544	7,613	9,729	9,043	9,237

[1] SHIFT replaced MEPS in July 1998.

Table 10: Indicators of Use of Various Cashless Payment Instruments – Volume of Transactions (thousands)

	1995	1996	1997	1998	1999
Cheques	78,470	82,504	87,542	87,343	92,180
Cards:					
Cards with cash function	• [2]	26	685	26,320	76,962
Debit [1]	46,648	56,188	66,055	73,340	75,802
Credit	•	•	•	•	•
Credit Transfers:					
Customer initiated (GIRO)	10,307	12,010	13,278	13,772	12,020
Direct Debits	17,306	20,099	23,202	20,665	17,360

[1] Figures are summation of EFTPOS transactions and interbank transactions initiated at ATMs. [2] CashCard was introduced only in December 1996.

Table 11: Indicators of Use of Various Cashless Payment Instruments – Value of Transactions (SGD millions)

	1995	1996	1997	1998	1999
Cheques	538,863	581,078	608,441	459,244	489,279
Payment Cards:					
Cards with cash function	• [2]	0.30	9.36	36.2	87.3
Debit [1]	4,625	5,786	6,844	7,031	6,500
Credit	6,153	6,986	7,916	7,690	8,949
Credit Transfers:					
Customer initiated (GIRO)	37,473	45,064	55,196	53,997	51,024
Direct Debits	11,222	14,914	18,645	15,503	15,080

[1] Figures are summation of EFTPOS transactions and interbank transactions initiated at ATMs. [2] CashCard was introduced only in December 1996.

Table 12: Transfer Instructions handled by Securities Settlement Systems – Volume of Transactions (millions)

	1995	1996	1997	1998	1999
Central Depository (Pte) Ltd (CDP)[1]	•	•	•	72,271	152,208

[1] Include Mainboard, SESDAQ and CLOB transactions.

Table 13: Transfer Instructions handled by Securities Settlement Systems – Value of Transactions (SGD millions)

	1995	1996	1997	1998	1999
Central Depository (Pte) Ltd (CDP)[1]	•	•	•	98,585	196,256

[1] Include Mainboard, SESDAQ and CLOB transactions.

Table 14: Summary of Penetration of Payment Instruments

	1995	1996	1997	1998	1999
Total Notes and Coins in Circulation (SGD millions)	10,756	11,276	11,733	11,338	14,209
Cheques					
Volume of Transactions (thousands)	78,470	82,504	87,542	87,343	92,180
Value of Transactions (SGD millions)	538,863	581,078	608,441	459,244	489,279
Payment Cards					
Number of Cards of which:					
Cards with Cash Function	• [1]	151,094	683,304	2,192,933	3,463,902
Debit Cards[2] (ATM Cards)	2,616,775	2,824,010	2,955,580	3,013,727	3,177,168
Credit Cards	6,164,042	6,594,825	7,211,566	7,880,071	8,586,839
Volume of Transactions of which:					
Cards with Cash Function	• [1]	25,995	684,853	26,320,412	76,962,223
Debit Cards[3] (thousands)	46,648	56,188	66,055	73,340	75,802
Credit Cards	•	•	•	•	•
Value of Transactions of which:					
Cards with Cash Function	• [1]	298,218	9,357,791	36,225,365	87,284,112
Debit Cards[3] (SGD millions)	4,625	5,786	6,844	7,031	6,500
Credit Cards (SGD millions)	6,153	6,986	7,916	7,690	8,949
Direct Transfers					
Volume of Transactions of which:					
Credit Transfers (Customer initiated GIRO) (thousands)	10,307	12,010	13,278	13,772	12,020
Direct Debits (thousands)	17,306	20,099	23,202	20,665	17,360
Value of Transactions of which:					
Credit Transfer: (Customer initiated GIRO) (SGD millions)	37,473	45,064	55,196	53,997	51,024
Direct Debits (SGD millions)	11,222	14,914	18,645	15,503	15,080

[1] CashCard was introduced only in December 1996. [2]Figures based on survey data from 8 banks (DBS, UOB, OUB, OCBC, KTL, HSBC, Standard Chartered and BNP). [3] Figures are summation of EFTPOS transactions and interbank transactions initiated at ATMs.

Annex 2

Core Principles for Systemically Important Payment Systems

I The system should have a well-founded legal basis under all relevant jurisdictions.

II The system's rules and procedures should enable participants to have a clear understanding of the system's impact on each of the financial risks they incur through participation in it.

III The system should have clearly defined procedures for the management of credit risks and liquidity risks, which specify the respective responsibilities of the system operator and the participants and which provide appropriate incentives to manage and contain those risks.

IV The system should provide prompt and final settlement on the day of value, preferably during the day and at a minimum at the end of the day.

V A system in which multi-lateral netting takes place should, at a minimum, be capable of ensuring the timely completion of daily settlements in the event of an inability to settle by the participant with the largest single settlement obligation.

VI Assets used for settlement should preferably be a claim on the central bank; where other assets are used, they should carry little or no credit risk and little or no liquidity risk.

VII The system should ensure a high degree of security and operational reliability and should have contingency arrangements for timely completion of daily processing.

VIII The system should provide a means of making payments, which is practical for its users and efficient for the economy.

IX The system should have objective and publicly disclosed criteria for participation, which permit fair and open access.

X The system's governance arrangements should be effective, accountable and transparent.

Responsibilities of the Central Bank in Applying the Core Principles

A The central bank should define clearly its payment system objectives and should disclose its role and major policies with respect to systemically important payment systems.

B The central bank should ensure its payment systems it operates comply with the Core Principles.

C The central bank should oversee compliance with the Core Principles by systems it does not operate and it should have the ability to carry out this oversight.

D The central bank, in promoting payment system safety and efficiency through the Core Principles, should cooperate with other central banks and with any other relevant domestic or foreign authorities.

Annex 4

List of Terms and Abbreviations

ABS	Association of Banks Singapore
ATM	Automated Teller Machine
BCCS	Board of Commissioners of Currency, Singapore
BCS	Banking Computer Services Pte Ltd
CASE	Consumers' Association of Singapore
DCCS	Debit Securities Clearing and Settlement System
DD	Demand Draft
DvP	Delivery-vs-Payment
ECS	Electronic Clearing System
EFTPOS	Electronic Funds Transfer at Point-of-Sale
GDP	Gross Domestic Product
IBG	Interbank GIRO
ICS	Image Clearing System
IOB	Internet Only Bank
LVTS	Large Value Transfer System
MAS	Monetary Authority of Singapore
MCB	Minimum Cash Balance
MEPS	MAS Electronic Payment System
MLA	Minimum Liquid Assets
MPSVC	Multi-purpose Stored Value Card
NETS	Network for Electronic Transfers Singapore Pte Ltd
PSSC	Payment and Settlement Systems Committee
POS	Point-of-Sale
SACH	Singapore Automated Clearing House
SCHA	Singapore Clearing House Association
SGS	Singapore Government Securities
SGX	Singapore Exchange
SHIFT	System for Handling Interbank Funds Transfer
SIBOR	Singapore Interbank Offered Rate
USD CCS	USD Cheque Clearing System

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Chapter 9

THE PAYMENT AND SETTLEMENT SYSTEMS IN SRI LANKA

by

A. Kamalasiri

1. Introduction

1.1 Historical Background

Prior to the establishment of the Central Bank, the functions of a clearing house (cheque clearing) were carried out by the Colombo Branch of the Imperial Bank of India. The Central Bank of Sri Lanka (CBSL) took over the inter bank cheque clearing in August 1950 and commenced clearing house operations manually. An automated clearing was introduced on 2nd March 1988, with the establishment of the Sri Lanka Automated Clearing House (SLACH). In 1993, the SLACH introduced the Electronic Funds Transfer system, an off-line inter-bank payment system which facilitated the use of diskettes/tapes in place of cheques or pay orders to effect the inter bank transactions. In 1981, a proprietary credit card was introduced by a non-bank financial institution. Commercial banks (LCBs) introduced credit cards and debit cards in 1989 and 1997 respectively. The CBSL joined the Asian Clearing Union (ACU) in 1974, which is an intra regional payment settlement system for member countries. In 1992 the CBSL became a direct participant of the Euroclear system and obtained EUCLID PC facility in 1994. In addition, the CBSL and many commercial banks in Sri Lanka joined the Society for Worldwide Inter-bank Financial Telecommunications (SWIFT) system during the same year.

1.2 Methods of Making Payments and Settlements

Instruments and methods used in the payment and settlement of monetary transactions in Sri Lanka include cash, cheques, credit and debit cards, direct debit and credit transfers, pre-paid cards and postal money orders.

1.3 The Institutions that Provide Payment and Settlement Services

The CBSL and LCBs are the main institutions that provide payment and settlement services. A limited number of specialised banks and non bank financial institutions participate in the payment system, particularly issuing credit cards or Automated Teller Machines (ATM) cards.

1.4 Legal Framework

In Sri Lanka, there is no specific legislation relating to payment and settlement systems. The Monetary Law Act No. 58 of 1949 (MLA), by which the Central Bank was established, requires the CBSL to provide facilities for clearance of inter-bank transactions and for settlement of balances through the deposit reserves maintained b LCBs in the CBSL. The MLA also requires the CBSL to provide facilities for the y transaction of government debt securities and C Dealers (PDs). In relation to banking transactions, the applicable Common Law is the central Bank securities among Primary English Law, in terms of the Civil Law Ordinance. The rights and obligations of banks and customers relating to paper based instruments such as c are governed by the Bills of Exchange Ordinance. The conduct of business by LCBs and requirements with regard to the maintenance of confidentiality are governed by the Banking Act No.30 of 1988.

2. Existing Payment and Settlement Systems

2.1 Domestic Payments

2.1.1 General Overview

The existing payment settlement systems are operated and managed by the CBSL. Two LCBs maintain and operate settlement accounts for inter-bank credit card settlements. There are two payment-clearing systems that operate currently in Sri Lanka. They are:

(a) The Sri Lanka Automated Clearing House (SLACH)
(b) The Sri Lanka Inter-bank Payment System (SLIPS)

Both systems are operated and managed by the CBSL while the participants of the systems are LCBs operating in Sri Lanka and the CBSL itself. The SLACH and SLIPS handle the small value transactions and fi-

nal settlements are carried out on reserve accounts/settlement accounts maintained at the CBSL on day-end net deferred settlement basis.

In addition to the SLACH, the CBSL operates three regional cheques clearing centers under the supervision of its regional branches. The participants of the regional clearing systems are LCBs operating in the respective geographical areas. The final settlement of clearing balances of regional centers are made across the reserve accounts of the respective LCBs maintain at the head office of the CBSL.

The CBSL operates a manually processing, same day value, day-end gross payment settlement arrangement for inter-banks and inter primary dealers (PDs). This arrangement deals with large value transactions, such as call money, foreign exchange, repo and reverse repo and government debt securities transactions. Under this arrangement, LCBs and PDs are required to send the cheques drawn on their current accounts at CBSL in favour of the payee bank or PDs in settlement of large value transactions, along with the credit vouchers prepared by themselves to the CBSL on the value dates. The cut-off time for sending such cheques is 3.30 p.m. on working days. The settlement of transactions of LCBs and PDs with the CBSL are effected by the CBSL itself by directly debiting and crediting the respective accounts, as the case may be. At the end of the working day, the CBSL processes manually all the instruments (cheques, credit and debit slips and vouchers) collected throughout the day and inputs them into its computer system to effect the final settlement. A detailed bank statement is made available to LCBs and PDs on the next working day at 8.00 a.m.

2.1.2 Payment Methods

2.1.2.1 Cash

Cash is a widely used payment medium for many types of transactions in Sri Lanka, particularly small value transactions. The CBSL has the sole right and authority to issue currency in Sri Lanka. Currency notes and coins issued by the CBSL are the liabilities of the Bank and unless demonetised, are legal tender under the law of the country for the payment of any amount.

At present, currency notes are issued in denominations of Rs.1000, Rs.500, Rs.200, Rs.100, Rs.50, Rs.20 and Rs.10 and coins in Rs.10, Rs.5, Rs.2, Rs.1, cts. 50, cts. 25, cts. 10, cts. 5, cts. 2 and ct.1.

The value of currency in circulation at the end of the year 1999 was Rs. 58,480 mn. of which about 96 per cent were currency notes. The relative importance of currency as a settlement media used by the public was remained at a level of about 54 per cent of the narrow money supply M_1. (M_1 = currency held by the public + transferable deposit held by the public)

Non-Cash Payment Instruments:

Four (4) main non-cash payment instruments/media are currently used in Sri Lanka.

a. Cheques
b. Direct debit and credit transfers.
c. Credit and debit cards
d. Postal money orders

2.1.2.2 Cheques

The cheque is the most frequently used non-cash payment instrument in Sri Lanka. There are two types of cheques used in the system. Those are cheques drawn on LCBs and cheques drawn on CBSL. Cheques drawn on LCBs are widely used by private and public institutions, Government Departments and individuals, largely for small value payments. Cheques drawn on CBSL are mostly used for large value payments, particularly inter-bank large value transactions, large value customer fund transactions and settlement for government securities transactions among PDs and LCBs, and to a lesser extent for small value transactions by the government. In 1999, there were about 37.4 million cheques, written and processed through the cheque clearing about 37.4 million cheques, written and processed through the cheque clearing system, for a value of approximately Rs. 2278 billion. The use of cheque as an instrument of payment has increased at an annual average of 7 per cent during the four-year period 1995 to 1999. However, the relative importance of cheques as cashless payment instrument has gradually decreased in the recent past. This may be due to the increase in the use of direct credit transfers as a payment instrument through the SLIPS system. The relative share of cheques in the total value of cashless payment instruments (cheques and direct transfers) which was about 91 per cent in 1995 has decreased to about 69 per cent in 1999, while the relative share of direct credit transfers has increased from about 9 per cent in 1995 to about 31 per cent in 1999. *(See chart 3.)*

2.1.2.3 Direct Debit and Credit Transfers

The method of direct debit and credit transfers is used by LCBs mainly for the settlement of small value large volume payments such as salaries, utility bills, pension funds, etc. During the year 1999, there were about 834 thousand direct debit and credit transfers for the value of Rs.1042.7 billion including few interbank large value transfers. The relative importance of direct transfers (credit and debit) as a cashless payment instrument has gradually increased, since the inception of SLIPS system facilitating direct transfers. The share of direct credit transfers in the total value of cashless payment instruments has increased significantly from about 9 per cent in 1995 to 31 per cent in1999. However, as a payment instrument, direct debit transfers are still used in a very limited scale while direct credit transfers are widely being used.

2.1.2.4 Credit and Debit Cards

Credit and debit cards are in use for various retail transactions and cash withdrawals. LCBs introduced credit cards to the country in 1989 and debit cards in 1997. Use of credit and debit cards issued by LCBs with international trade marks such as VISA, Master Card and American Express and with their own trade marks have increased and are becoming more acceptable instruments for payment in the larger cities and towns. The total number of credit cards issued and in use at the end of 1995 was about 32,000 (estimates) and it has increased to 143,000 at the end of 1999, recording a more than 300 per cent increase over the 4 year period. The value of credit card transactions (estimated value) has also increased by about 700 per cent from Rs. 674 million in 1995 to about Rs.5, 300 million in 1999.

2.1.2.5 Postal Money Orders

Postal Money Orders are used by public for their individual small value payment settlements through the island-wide branches of Government Post Offices. At the end of year 1999, there were 4040 Post Offices including main offices & sub offices and about 2.8 million postal money orders for a total value of Rs. 7 billion have been issued and settled during the year.

2.1.3 Structure, Operation and Administration

2.1.3.1 Sri Lanka Automated Clearing House

The Sri Lanka Automated Clearing house was established by the Central Bank of Sri Lanka in 1988. A computerised high-speed document processor and new cheque leaves with Magnetic Ink Character Recognition (MICR) character were introduced for the purpose of automated cheque clearing.

The CBSL is empowered by the MLA to provide clearing and settlement arrangements for inter-bank payment settlements; hence the operation and management of the SLACH are made by the CBSL. The SLACH is located in the main city (Colombo) which is the financial center of Sri Lanka and where the head offices (main branches) of all LCBs are located.

a. Participants in the System

The CBSL and all LCBs operating in Sri Lanka, numbering 26, are the direct participants in the system. Bank branches participate through their respective head offices. In Sri Lanka, by law, only the LCBs are permitted to maintain transferable deposit accounts (current accounts). The CBSL participates in the system as the banker to the Government, Agencies & Institutions acting on behalf of the Government, who maintain current accounts with the CBSL.

b. Types of Transactions Handled

The SLACH facilitates clearing of cheques drawn in Sri Lanka rupees (local currency), Sri Lanka rupee (Rs.) drafts, dividend warrants and foreign drafts issued in Sri Lanka rupees. There is no lower or upper limits on the payment instruments to be cleared through the SLACH. But the majority is small value instruments.

c. Operation of the System

The SLACH commences its operations at 2.15 p.m. on each working day. The amount (value) of each cheques collected by LCBs during the day are encoded in magnetic ink and bundles into batches of 200 by the collecting banks/branches. These bundles are dispatched to the SLACH

before the cut-off time of 5.00 p.m. on each working day, along with the add-list of each bundle. The SLACH receive around 1000 batches, averaging over 150,000 cheques per day.

The SLACH process these cheques and sorted them into bank/branches (issuing banks) by using a MICR reader machine which has a capacity to read and capture the all magnetic ink characters of each cheque onto computer disk files at a speed of about 1600 cheques per minute.

Cheques rejected by the machine are entered into the database through a manual "keying-in" process. The credit given in the batch ticket should match the total debits obtained by 'reading' the amount of each cheque. If they do not match, a manual balancing procedure is adopted. Once all batches are balanced, SLACH prepare reports giving details lists of outward items, inwards items, and net clearing balances of each bank. A consolidated outward/inward report showing the multilateral net clearing balances of each bank is prepared for the CBSL.

Apart from these reports, the inward clearing data are provided to the computerised banks in tapes or diskettes around 10.00 p.m. The inward items and reports are collected by the banks at 6.00 a.m. on the following day. Some banks collect them at around 10.00 p.m. on the same day to dispatch to distant areas.

The SLACH, in consultation with the commercial banks, has formulated a clearing time schedule applicable to all commercial banks taking into consideration the geographical distribution of branch network. The applicable time schedule varies from 1 to 7 days. All cheques dishonoured and returned through the settlement clearing are returned to the presenting banks within the number of days prescribed in the time schedule. The settlement clearing continues to be manual process and clearing is held at 12.00 noon on every working day.

d. Volume of Transactions Handled

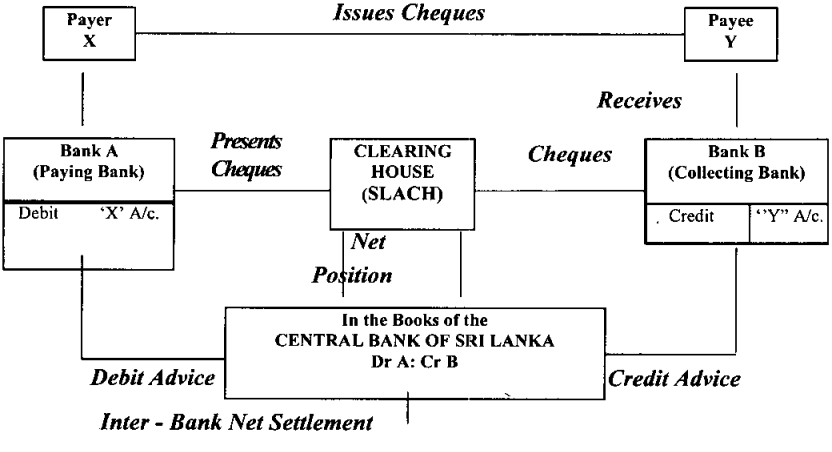
The volume and value of cheques processed in SLACH are increasing (see table 8& 9). During the year 1999' about 33 million cheques amounting to the value of Rs. 2,034 billion were processed in SLACH. The corresponding figures for year 1995 were 26 million cheques and value Rs 1,430 billion. The volume of cheques processed in SLACH has increased by an annual average rate of 6 percent during the period of 1995 to 1999.

e. Settlement Procedure

Final settlement of cheques clearings are conducted on multilateral net basis across the reserve accounts of participating banks at CBSL. In the case of settlement clearing, the net balances of each bank are reported to the CBSL immediately after the conclusion of the settlement clearing i.e. around 1.30 p.m. The net balances so reported are input to the CBSL's current accounts system on the same day and update the reserve accounts of participating banks maintained with the CBSL by debiting or crediting the net balances as the case may be.

The value date for settlement of main clearing balances is the working day immediately following the day of clearing. The net clearing balances of main clearing of each participant are transmitted to the AS 400 main computer system of the CBSL from the SLACH after completion of days clearing. The next working day, the settlement balances are down loaded to the CBSL's current accounts system and the reserve accounts of participating banks at the CBSL are updated with the respective net balances. All LCBs operating in Sri Lanka are required by law to maintain a reserve account with the CBSL for the purpose of maintaining the Statutory Reserve Requirement (SRR). At present, LCBs are required to maintain 11 per cent of the deposit liabilities in Rupees as SRR. The same accounts are used for the final settlements of interbank transactions.

SRI LANKA AUTOMATED CLEARING HOUSE (SLACH)
CHEQUES CLEARING SYSTEM



f. Pricing Policy

The pricing policy of the SLACH of the CBSL is formulated to recover the operating cost of the system. A fee is charged on transaction volume basis from the participants receiving the cheques (inward cheques). *(see Appendix I)*

g. Management of Risks

The existing inter bank settlement arrangements is a day end net settlement arrangement across the reserve account of LCBs at the CBSL. The reserve accounts are not updated during the day. Therefore, an intra day liquidity arrangement does not exist. But overnight credit facilities under the repurchase agreements are provided by the CBSL to all participants to meet their inter-day liquidity shortages. LCBs have their own interbank credit exposure limits decided by them to minimise their credit and liquidity risks. These limits are, however, not disclosed. There is no loss sharing arrangements or unwinding clauses and the need of such arrangements has never been experienced.

2.1.3.2 Sri Lanka Interbank Payment System

a. Participants in the System

LCBs operating in Sri Lanka and the CBSL are the direct participants in the system. The total number of participants at present including CBSL is 27. Other financial institutions, corporate bodies and individuals participate indirectly in the system through their correspondent LCBs.

b. Types of Transactions Handled

Small value direct credit and debit transactions and large value interbank transactions are the type of transactions handled in SLIPS. Credit transactions include payment of salaries, dividend payment for shareholders, pensions and standing orders of the customers etc. while direct debit transactions include mainly claims relating to utility bills such as electricity, telephone and water, etc. and insurance premiums. However, direct debit transfers are still used in a limited scale. This is partially due to the lack of awareness of the system by utility customers and partially because of the utility companies themselves, which have not yet been fully persuaded of the benefit of the system.

c. Operations of the System

Participating institutions input the details of credit or debit instructions received from their corporate customers to a magnetic tape or diskette along with their outward items such as standing orders and large value inter-bank payment obligations. The originating banks present these tapes or diskettes to SLACH by 3.30-p.m. daily (on working days). Since data are accepted only on magnetic media, only the computerised banks could participate in this system. Within two hours, the SLACH processes them and provide tapes/diskettes containing the transaction details to all banks. In this process, credit transactions of originating banks are credits to receiving banks and debit transactions are debits to receiving banks, as the case may be.

Under the SLIPS, banks are provided with printed reports in addition to magnetic media data. The printed reports will enable non-computerised banks to update their customer's accounts and positions with participating banks.

At the end of day's clearing process, a "Consolidated Summary Tape" giving the multilateral net positions of each bank is created and sent to the CBSL for the purpose of updating current accounts of participating banks at the CBSL.

d. Volume of Transactions Handled

The volume of transactions handled in the SLIPS system since its inception is gradually increasing. The total number of items handled in 1995 was about 118,000. It has increased to about 835,000 in 1999 recording a more than 700 per cent increase over the 4 years period. However, the system is still under-used for direct debit transfers, but widely used for direct credit transfers.

e. Settlement Procedure

Settlements are conducted on a multilateral net deferred same day value basis across the reserve accounts of LCBs at CBSL. On receipt of "Consolidated Summary Reports" from the SLACH to the CBSL, the net settlement positions are input into the CBSL's current accounts system and accounts of LCBs are updated by debiting or crediting, as the case may be.

f. Pricing Policy

The SLACH charges a processing charge of 25 cents per item on SLIPS transactions on originating banks, subject to a minimum operating fee of Rs.250.00 per month per bank. The policy is to cover only the running cost of the system.

g. Management of Risk

The management of credit and liquidity risk under the SLIPS system is similar to the management risk under other payment settlement arrangements operating in Sri Lanka [See item 2.1.3.1 (g)]

2.2 Cross Border Payments

2.2.1 General Overview

In Sri Lanka, the cross border payments are effected through the correspondent banks abroad. In this regard, two types of methods are used. They are cross border settlements by LCBs directly through their correspondent banks abroad on gross settlement basis and settlement of intra-regional transactions among member countries of Asian Clearing Union (ACU) through the ACU intra regional multilateral net deferred settlement system. As the Sri Lanka rupee is not an internationally accepted currency, all cross border payments are made in major foreign currencies such as US dollars, sterling pounds, Japanese yen and Euro. Over 50 per cent of the settlements are made in US dollars. Only the authorised dealers appointed by the Minister in charge of Finance are permitted to engage in all types of foreign exchange transactions. At present, only LCBs are appointed as such authorised dealers. In addition the money changers appointed by the CBSL are permitted to purchase convertible foreign currencies in exchange of Rupees and exchange one convertible currency for another. However, under any circumstances, money changers are not permitted to sell foreign currency against Rupees or accept/issue traveller's cheques or other financial instruments.

2.2.2 Payment Methods

Payment instruments that are used in Sri Lanka for international transactions are foreign currencies, traveler's cheques, foreign drafts, credit and debit cards issued under the license of international card companies, telex

transfers and electronic media such as SWIFT and Euroclear systems. Foreign currency, travellers' cheques and credit and debit cards are used by residents travelling abroad for small value retail transactions. Telex transfers and electronic media are the most commonly used method for the payment settlement of current international transactions (international trade transaction) and capital account transactions.

2.2.3 Structure, Operations and Administration

The CBSL and LCBs appointed as authorised dealers are the only participants in cross border payment settlement systems in Sri Lanka. Currently, 25 LCBs participate in the international foreign exchange transactions of which 16 are foreign banks (subsidiaries or branches of banks incorporated abroad). Cross-border payments both small and large value payments relating to current international transactions are mainly handled by the LCBs. The CBSL is the major participant in payments relating to capital account transactions. The CBSL participates in cross border payments in its capacity as the banker to the government and fiscal agent to the government as it is responsible for the timely settlement of government foreign loan obligations and collection and disbursements of such loans and grants. The CBSL engages in buying and selling of foreign exchange in US dollars with LCBs in the domestic foreign exchange market in discharging its obligation in stabilising the external value of the Sri Lanka rupee and ensuring the free convertibility of the Sri Lanka rupee for current international transactions.

2.2.3.1 Settlement Procedure

The foreign currency settlement of international transactions, both small and large value payments is effected through the correspondent banks abroad. In the case of foreign banks operating in Sri Lanka, this relationship is based upon ownership links, while in the case of locally incorporated banks; the relationship is mostly a commercial one. With regard to the locally incorporated commercial banks, only one commercial bank (state owned) has own branches abroad. The correspondent banks abroad of the CBSL in most cases are the central banks or the monetary authorities of the respective countries. The CBSL also maintains nostro accounts with large internationally recognised banking institutions abroad for special payment and settlement arrangements. International payment and settlement instructions are mostly transmitted through the SWIFT system. The CBSL and LCBs were linked to the SWIFT network system in June 1994. At

present, 20 commercial banks and one development bank in Sri Lanka are participants of the SWIFT network. The Euroclear system is used by the CBSL for the settlement of foreign securities transactions only. The fund transfers against such security transactions are made via the SWIFT network. The telex system is used mainly for countries that are not yet linked to the SWIFT network and as a backup for the latter in the event of technical failure.

The domestic currency leg i.e. Sri Lanka rupee payment against foreign exchange transactions between the authorised dealers and the customers in relation to international trade transactions and retail payments, are mostly settled as direct payments in cash or internal fund transfers from the customer's account to the correspondent bank on the day the transaction is initiated.

In the case of interbank foreign exchange transactions including the CBSL, domestic currency settlements are made across the reserve account of the LCBs at the CBSL as day end gross settlement basis (*see Large Value Funds Transfer System operated by CBSL).* The value date of the settlement in Sri Lanka rupee is the same value date of the settlement of relevant foreign currency across the Nostro accounts at the relevant correspondent banks abroad.

In addition to the above system, LCBs make use of the off-line electronic fund transfer system i.e. SLIPS on a limited scale for the settlement of Sri Lanka rupees against the inter-bank foreign exchange transactions.

2.2.4 Asian Clearing Union

(Intra-Regional Payment Settlement System)

The Asian Clearing Union (ACU) is a simplest form of a multilateral payment arrangement system, which facilitates the members to settle payments for intra-regional transactions among the participating central banks on a multilateral net deferred basis. The Central Bank of Sri Lanka joined the ACU in 1974, at the inception of the system. Other members of the ACU at present are Bangladesh Bank, Reserve Bank of India, Central Bank of Myanmar, Central Bank of the Islamic Republic of Iran, Nepal Rastra Bank, State Bank of Pakistan and Monetary Authority of Bhutan (since May 2000).

According to the ACU arrangement, all payments relating to trade and trade related transactions among residents from member countries should be routed through the ACU payment system. Under this payment settlement arrangement, commercial banks of each member country are required to keep separate accounts (Nostro accounts) with their branches or correspondent banks in other member countries, which are designated as "correspondent accounts" and designed to facilitate intra-regional settlements.

The settlement procedure is the payment arising on trade transactions with member countries are first settled (on agreed date) by the commercial bank (paying bank) to its central bank in US dollars (through the correspondent bank abroad) and requested to pay the same to its nostro account at the correspondent bank in the other member country (receiving country). In turn the central bank of the paying country advises the member central bank of the receiving country to make the payment accordingly. The member central bank makes the payment settlement to its local commercial bank in US dollars through their US dollar correspondent bank network, and advises its local commercial bank to credit that amount to the nostro account of the paying commercial bank, which is maintained with them. The member central bank (receiving country) simultaneously instructs the ACU to credit its account and debit the paying member central bank's account (settlement accounts), which are maintained at ACU Head Office, with the correspondent amounts.

The ACU Head Office maintains settlement accounts in US dollars, named as ACU dollars, for each member central bank and records the debit and credit entries on those accounts as advised by the respective member central banks. Interest is debited or credited to the account at the end of each working day, depending on net debit or credit balance of the respective account. At the end of the settlement period, i.e. two months, the ACU Head Office informs the net positions of each bank for the final settlements among member central banks. The CBSL makes the final settlements in US dollars through its correspondent bank abroad.

3. The Implication of the Existing Payment and Settlement Systems for Financial Stability

3.1 Monetary Policy

The Monetary Law Act provides the CBSL with a wide range of instruments that could be used for implementing the monetary policy. The

main instruments available to CBSL are Bank Rate, Statutory Reserve Requirement, Open Market Operations (OMO), selective credit controls, cash margins against Letters of Credit, foreign exchange operations and moral suasion. The objective of the monetary policy is the stabilisation of real value of the national currency (the rupee) i.e. price stability. The CBSL has gradually moved away from direct policy instruments (i.e. Bank Rate, SRR, credit and interest rate control) to indirect market based policy instruments in implementing the monetary policy. OMO has become the most important and market based monetary policy. The CBSL conducts its OMO to influence liquidity in the money market on the basis of outright buying and selling of government securities as medium term to long term measures and re-purchase and reverse repurchase transactions on government securities as short term policy measures. With the move from direct control to OMO, the Bank Rate has been replaced by the CBSL's repurchase and reverse repurchase rate as the main mechanism for signaling to the market the direction of the monetary policy. Currently, the intervention of the CBSL is passive, but consideration is being given to moving towards more active market oriented OMO. The efficiency and effectiveness of monetary policy are affected by the efficiency and reliability of the payment system.

3.1.1 Timely Information

Currently, in the implementation of monetary policy, the monetary policy framework targets broad money, while using reserve money as an intermediate target. With reserve money as the interim target, it is imperative that information on this variable be obtained at least with a one-day lag. If the payment and settlement system cannot deliver the relevant information on time, as required, the whole targeting framework would fall apart. The existing payment system is capable of delivering this information with a one-day time lag, as final settlement of interbank transactions is made through the reserve account of LCBs at CBSL, which are maintained at the CBSL Head Office.

The broad money target in the monetary policy framework has become necessary because new innovations such as transfers between savings accounts and demand deposit accounts, pre-mature withdrawals from time deposits, automated teller machines made savings and time deposits are much more liquid. But one major reason for still using reserve money rather than broad money, as the intermediate target is the time lag in obtaining information on broad money under the current payment and settlement system.

An improvement in the payment and settlement system which reduces the time lag would enable a faster response to development.

Money market liquidity assessment is a fundamental requirement for effective open market operations and such assessments would require to be made both on daily basis and with a longer term forecast. More accurate estimates tend to make more effective OMO. Accurate assessment of liquidity is affected by the payment system particularly because the time lag between the transfer of government revenue to and payments from the Treasury Accounts through which large inflows and outflows are made to the financial system.

3.1.2 Effective Conduct/Implementation of Monetary Policy

The transmission mechanism and quick and accurate recording of transactions are two major areas of concern that arise in the implementation of monetary policy in the context of the payment and settlement systems. First, the transmission mechanism in Sri Lanka essentially moves from the CBSL's repo and reverse repo rate, to call market rates, to market liquidity, to changes in the lending rates and rates on government securities, to credit availability and finally to real variables. The efficiency and effectiveness of this mechanism is vitally affected by the payment and settlement system. Secondly, in view of the fact that monetary aggregates are targets, it is extremely important that these values reflect current conditions. Delays and inefficiencies in the payments and settlements system can distort these variables significantly, e.g. by increasing the value of cheque float, resulting in policies being made based on incomplete or even erroneous data.

3.2 Payment System Oversight

In Sri Lanka, there are no specific provisions relating to oversight or regulation of the payment system. But there are provisions in the MLA of 1949 and the Banking Act of 1988, for the general oversight or regulation of banking institutions, particularly LCBs which are the major direct participants in the payment system in Sri Lanka. The Director, Bank Supervision has been empowered to regulate, supervise and examine the LCBs with the prime objective of ensuring the stability of the financial system of the country.

The Banking Act of 1988 and its subsequent amendments and notices and directions issued under the Banking Act provide the regulatory frame-

work for effective regulation of LCBs in Sri Lanka. The regulatory framework generally falls in line with the core principles stipulated by the Basel Committee for effective banking supervision.

The regulations that are in force mainly deals with the capital adequacy requirements, liquidity asset ratio requirements, loan loss provisions, adequacy of policies and procedures for risk management, single borrower limits and accounting standard etc.

The stability of the financial system is ensured by establishing adherence to the above regulations through continuous on-site examinations (undertaken by the regulatory authority once in two years) and off-site surveillance of LCBs. For the purpose of off-site surveillance, a series of statistical returns are obtained from banks on a monthly, quarterly or annual basis. An analytical report based on monthly and quarterly statements is submitted to the Monetary Board quarterly, identifying strengths and weaknesses of individual banks and recommending remedial action, if necessary, to be taken for the smooth functioning of the banking system. This process of regulation and supervision of banks strengthens the stability of the financial system while providing protection to consumers.

3.3 Competition/Innovation

In Sri Lanka, there are no specific legal provisions with regard to the entry into the payment system. Currently, the CBSL is the only institution, which operates and manages the interbank payments clearing arrangements and the settlement facilities. The CBSL has provided these facilities since its inception, as it is a requirement under the MLA for the CBSL to provide such facilities for the development of banking services in the country. But there is no specific legislation preventing other institutions individually or collectively providing clearing arrangements for any type of payment instrument.

Entry into the payment system by any institution/company as a banking institution is subject to obtaining authority or license from the Monetary Board with the approval of Minister in-charge of Finance, in accordance with the criteria set out in the Banking Act. Banking institutions are free to engage in payment services and introduce payment instruments in compliance with the rules and regulations and operating instructions issued and imposed by the CBSL from time to time for the banking services. The objective of such rules and regulations or supervisory and regulatory frame-

work is to ensure the soundness of individual banking institutions and the stability of the financial system as a whole, rather than discouraging or preventing new institutions entering into the payment system or introducing new products by existing banks.

As explained earlier, LCBs are the major participants in the payment system. Only LCBs can provide payment facilities by cheques. The total number of LCBs operates in Sri Lanka at present is 26, consisting of 2 state banks, 8 domestic private banks and 16 foreign banks. The increasing number of domestic private and foreign banks and domestic banks has led to increased competition among themselves for the share of the financial market and it has led to a greater efficiency and improved services. Facilities provided by LCBs expanded in a competitive environment to cater to the growing needs of customers. This competitive environment led the LCBs to introduce many new products such as ATMs, credit cards, debit cards, Point of Sales (POS) and electronic fund transfers and services such as phone banking, internet banking, on line services and extended banking hours.

4. Consumer Protection

4.1 Payment System/Payment System Providers

As mentioned in the previous sections, there is no specific legal enactment to deal with payment and settlement systems in Sri Lanka. But, there are several laws, rules and regulations, contractual agreements and institutional arrangements that indirectly relate to payment service providers and protect users of services extended by these institutions.

In Sri Lanka, only LCBs, other than CBSL are permitted by law to accept demand deposits (transferable deposits) and hence, those are the only institutions that provide payment services by using debit instruments. LCBs operating in Sri Lanka are regulated and supervised by the CBSL. One of the aims and objectives of the regulation and supervision of LCBs is to protect the interests of the depositors. As LCBs are regulated bodies, to that extent customers of LCBs are protected by the regulatory and supervisory regimes. However, issues relating to payment services or customers protection are not specifically addressed in the regulatory regimes for LCBs. There are provisions in the Banking Act and MLA, to safeguard the deposits of the customers in instances of liquidations of banking institutions. Except in the case of payment by cheque (where the rights and obligations

would be governed by the Bills of Exchange Ordinance), the rights and obligations of other payment instruments user and providers such as credit cards and debit cards are governed by the rules of the payment system and the contracts that are entered into by the parties. The contracts would be subject to Unfair Contract Terms Act No. 26 of 1977. This Act restricts the effectiveness of the terms of contract that exclude or restrict liability for negligence, and of standard terms of contract of business that are applied to consumers. The English Law in terms of the Civil Law Ordinance is applicable in relation to banking transactions. The conduct of business by banks and requirements with regard to the maintenance of confidentiality (privacy) are governed by the Banking Act No. 30 of 1988. Apart from the above, some of the provisions of the Consumer Protection Act No. 1 of 1979 would apply in relation to misleading conduct, false representations, etc.

The Prescription Ordinance in Sri Lanka requires the financial institutions to keep detailed records of all transactions for at least a six year period from the date each transaction was done. The CBSL, including the SLACH, maintains its records in electronic form and hard copies (documentary) for more than 6 years to enable to access to historical records for audit trials.

The CBSL has upgraded its back-up computer facility to recover the system quickly from any operational disruption. LCBs operating in Sri Lanka also have their own back-up systems and keep records in accordance with the Prescription Ordinance. Most of the back-ups are kept outside the operational location as a precautionary measure.

5. Recent Payment System Developments and Policy Initiatives

The CBSL plays a major role in the development of the payment systems in Sri Lanka and the following policy initiatives have been taken recently for the development of the payment system:

(a) Establishment of a Real Time Gross Settlement System (RTGS) for large value and other critical fund transfers;
(b) Setting up of a scripless central depository and settlement system for scripless government debt securities and its integration with RTGS to facilitate DvP.
(c) Automation of general ledger and accounting system to support CBSL's future financial operations.

The purpose of the RTGS system is to provide the infrastructure by which selected payments between financial institutions and between financial institutions and CBSL can be cleared and settled in a secure and timely manner. The objective of the RTGS payments is to establish the payment infrastructure required supporting the development of financial markets and banking sector and reducing settlement risks in the payment system.

The CBSL is currently in the process of obtaining support to prepare the groundwork towards setting up of RTGS system (with financial assistance from the World Bank).

The CBSL established a Wide Area Network (WAN) as an in-house project, connecting the head offices of all LCBs and PDs with the CBSL computing facility through the Sri Lanka Telecom data communication network, to facilitate on-line electronic fund transfers for large values among those institutions, as an interim step towards the proposed RTGS system.

The Scripless Securities Trading System (SSTS), inclusive of the Central Depository System (CDS) and EFTS have been developed for the use of primary auction of government debt securities on DvP terms.

6. Suggestions and Recommendations on the Role of the Central Bank in Ensuring the System and Efficiency of the Payment and Settlement System

.a) Formation of an on-line electronic fund transfer system which facilitates speed, secured and timely settlement of large value payments.

At present, the large value fund transfers are made through the paper based instruments and settlements are made on day end gross settlement basis. This has an element of uncertainty or a settlement risk, as the final settlement of each transaction is known to the participant only on the following day. The efficiency of the payment system has affected due to such factors.

The CBSL is in the process of introducing a Real Time Gross Settlement (RTGS) system for large value fund transfers in order to overcome the above problems. In this process, the CBSL should ensure that the RTGS system should comply with the Core Principles for systemically important payment systems identified by the Bank for International Settlements (BIS).

(b) One of the shortcomings identified in the present payment settlement system is non-existence of a proper legal framework. Initiatives should be taken by the Central Bank in conjunction with other relevant Ministries and Institutions directly or indirectly involved in payment settlement systems to formulate an appropriate legislation to cover the issues relating to the Payment Settlement System. The special attention should be given to the issues relating to electronic media payment settlement system, in the process of formulating such legal framework. The security of electronic transactions, recognition of electronic contracts, signatures, and records for legal purposes, customer protections, frauds relating to such instruments, and computer crimes are the appropriate areas to be dealt in this process.

Under the present payment and settlement system, there is no clearly defined procedure for management of risks involved in the payment settlement system. Hence, the Central Bank should address the issues of risk management in its process of developing a safety and efficient payment settlement system.

(c) Initiatives should be taken by the Bank through LCBs/Bank's Associations to encourage the public utility companies to use the direct debit transfer system for the collection of payments relating to utility bills and thereby maximise the use of existing payment and settlement system like SLIPS system.

(d) The Central Bank should clearly define its underline objectives of the payment system and should disclose its role and major policies with respect to the payment settlement system.

(e) The Central Bank should consider to introduce an institutional and regulatory framework to oversight the payment systems that are not operated by the Central Bank and to oversee their compliance with the Core Principles. At present, there is no such regulatory framework as the CBSL is the operator of the existing payment clearing system. However the new entrants to the payment settlement systems as operators cannot be ruled out with the new developments and the innovations in the financial market. In such an event, the CBSL should be able to oversee those systems with clearly formulated regulatory framework.

Country Tables

Table 1: Major Event Affecting the Payment and Settlement Systems

Date	Major Development
August 1950	The CBSL took over functions of Colombo Clearing House
December 1974	The CBSL joined the ACU (Intra Regional Clearing Arrangement)
September 1981	Introduction of Proprietary Credit Card - Non Bank Financial Institutions
June 1986	Introduction of ATM's
March 1988	Sri Lanka Automated Clearing House (SLACH)
February 1989	Introduction of Credit Cards - Commercial Banks
August 1992	The CBSL joined the Euroclear System
March 1994	Electronic Funds Transfer at POS
August 1994	SLIPS-off Line Electronic Fund Transfer System
June 1994	Joined the S.W.I.F.T.
March 1997	Introduction of Debit Cards

Table 2. Selected Country Indicators

	1995	1996	1997	1998	1999
Population (millions):					
Mid year	18.136	18.336	18.552	18.774	19.043
GDP *(Rs. billion)*	668	768	890	1,018	1,106
GDP per capita *(Rupees)*	36,869	41,940	47,988	54,220	58,077
Exchange Rate (against USD)					
Year end	54.05	56.71	61.29	67.78	72.12
Average	51.25	55.27	58.99	64.59	70.39

Source: Annual Reports, Central Bank of Sri Lanka

Table 3. Settlement Media used by Non-banks (at year end)

	1995	1996	1997	1998	1999
***Notes and coin* (Rs. billion)**	42.2	42.6	44.8	51.4	58.5
Transferable deposits *(Rs. billion)*	33.0	35.6	40.2	44.6	50.1
Narrow money supply (M1) *(Rs. billion)*	75.2	78.2	85.0	95.9	108.6
Memorandum item:					
Broad money supply M_{2b} *(Rs. billion)*	259.4	288.6	333.7	377.7	428.3

Source: Annual Reports, Central Bank of Sri Lanka

Table 4. Settlement Media used by Banks (Rs. Million)

	1995	1996	1997	1998	1999
Reserve balances held at central bank [1]	31,853	35,907	30,537	32,748	30,220
of which:					
Required reserves [2]	26,941	31,364	27,846	30,020	28,575
Free reserves [3]	4,912	4,543	2,691	2,728	1,645
Transferable deposits	0	0	0	0	0
Memorandum item: Institution borrowing from central bank[4]	0	0	0	6	514

1 *The actual reserves that were maintained on the last working day of the period.*
2 *The average daily required reserves applicable for the last week of the period.*
3 *Excess reserves that were maintained at the end of the last working day of the period.*
4 *LCBs borrowings under reverse repurchase facility; outstanding amount of the last working day of the period.*

Table 5. Institutional Framework (1999)

Categories	Number of Institutions	Number of Branches	Number of Accounts	Value of Accounts (Rs.Million)
Central Bank [1]	01	03	310	62,044
Commercial: [2]	25	1,055	16,283,738	325,613
Public	02	672	13,035,725	165,053
Private	07	341	3,104,103	131,794
Foreign	16	42	143,910	28,766
Development and investment banks: [3]	12	311	n.a.	n.a.
Public	02	103	n.a.	n.a.
Private	10	208	n.a.	n.a.
Foreign	0	0	0	0
Special Finance Houses of which	8,990	-	-	-
Finance Companies	25	51	140,965	16,960
Others [4]	8,965	n.a.	n.a.	n.a.
Money Exchangers	30	n.a.	-	-
Post Office	586	3,454	-	-

Source: Central Bank of Sri Lanka

1 *Includes accounts of LCBs, PDs, International Organisations, Government, Government Departments and Agencies.*
2 *Licensed Commercial Banks*
3 *Licensed Specialised Banks (Savings Banks, Development Banks, Housing Finance Institutions)*
4 *Includes other deposits taking institutions such as rural banks, Theft and Credit Societies, other Housing Finance Institutions, Contractual Savings Institutions, Specialised Savings Institutions and Unit Trusts.*

Table 6. Cash Dispensers, ATMs and EFTPOS Terminals

	1995	1996	1997	1998	1999
Cash dispensers and ATMs:					
Number of networks (year-end)	2	2	2	2	2
Number of Machines (year-end)	135	161	197	267	316
Volume of transactions (during)	n.a.	n.a.	n.a.	n.a.	n.a.
Value of transactions (during)	n.a.	n.a.	n.a.	n.a.	n.a.
EFTPOS:					
Number of networks (year-end)	2	2	2	2	2
Number of Machines (year-end)*	n.a.	166	482	1537	1996
Volume of transactions (during)	n.a.	n.a.	n.a.	n.a.	n.a.
Value of transactions (during)	n.a.	n.a.	n.a.	n.a.	n.a.

Source: Respective Institutions

* *Estimates*

Table 7. Number of Payment Cards in Circulation (at year-end)

	1995	1996	1997	1998	1999
Cards with a cash function	n.a.	n.a.	n.a.	n.a.	n.a.
Cards with a debit/credit function					
Of which					
Cards with debit function	0	0	n.a.	59,000	201,650
Cards with credit function	32,000	31,000	55,000	82,000	143,004
Cards with a cheque guarantee function	n.a.	n.a.	n.a.	n.a.	n.a.
Memorandum item: Retailer cards	n.a.	n.a.	n.a.	n.a.	n.a.

Source: Respective Institutions

Table 8. Payment Instructions Handled by Selected Payment Systems: Volume of Transactions (in thousands)

	1995	1996	1997	1998	1999
Retail					
Sri Lanka Automated Clearing House(SLACH)	25,793	27,708	29,262	31,356	32,664
Cheques					
Retail & Large Value					
Sri Lanka Interbank Payment System(SLIPS)					
Direct Credit Transfers[1]	118	211	293	496	834
Direct Debit Transfers	n.a.	n.a.	n.a.	n.a.	n.a.
Retail					
Regional Clearing Centers					
Cheques	1,016	1,139	1,278	1,352	1,361
Post Office:					
Postal money orders	n.a.	2,293	1,427	2,374	2,800
Postal cheques	-	-	-	-	-

[1] Including few number of interbank large value transfers

Source: Central Bank of Sri Lanka

Table 9. Payment Instructions Handled by Selected Payment Systems: Value of Transactions (Rs. billion)

	1995	1996	1997	1998	1999
Retail					
Sri Lanka Automated Clearing House (SLACH)	1,430	1,610	1,827	1,968	2,034
Cheques					
Retail and Large Value					
Sri Lanka Interbank Payment System (SLIPS)					
Direct Credit Transfer[1]	148.2	264.2	366.0	619.8	1042.7
Direct Debit Transfer	n.a.	n.a.	n.a.	n.a.	n.a.
Retail					
Regional Clearing Houses					
Cheques	24	28	36	36	37
Post Office:					
Postal money orders	n.a.	6	4	7	7
Postal cheques	-	-	-	-	-

[1] Including few number of interbank large value transfers *Source: Sri Lanka Automated Clearing House*

Table 10. Indicator of Use of Various Cashless Payment Instruments: Volume of Transactions (in thousands)

	1995	1996	1997	1998	1999
Cheques issued ('000)	29,490	31,732	33,594	35,979	37,428
Payments by cards:					
Credit cards	n.a.	n.a.	n.a.	n.a.	n.a.
Debit cards	n.a.	n.a.	n.a.	n.a.	n.a.
Direct Transfers:					
Direct Credit Transfer[1]	118	211	293	496	834
Direct Debit Transfer	n.a.	n.a.	n.a.	n.a.	n.a.
Postal money orders ('000)	n.a.	2,293	1,427	2,374	2,800

[1] Including few number of interbank large value transfers.

Table 11. Indicator of Use of Various Cashless Payment Instruments: Value of Transactions

	1995	1996	1997	1998	1999
Cheques issued (Rs. bn.)	1,599	1,802	2,049	2,204	2,278
Payments by cards:					
Credit cards(Rs. Mn.)	674	1,057	2,540	3,832	5,303
Debit cards	n.a.	n.a.	n.a.	n.a.	n.a.
Direct Transfers:					
Direct Credit Transfers[1] (Rs. bn.)	148.2	264.2	366.0	619.8	1042.7
Direct Debit Transfer	n.a.	n.a.	n.a.	n.a.	n.a.
Postal money orders (Rs. bn.)	n.a.	6	4	7	7

[1] Including few number of interbank large value transfers.

Table 12. Penetration of Payment Instruments

Payment Instrument	1995	1996	1997	1998	1999
Cash (Rs. bllion)	42.2	42.6	44.8	51.4	58.5
Volume of Cheques (in thousands)	29,490	31,732	33,594	35,979	37,428
Value of Cheques (Rs. billion)	1,599	1,802	2,049	2,204	2,278
No. of Credit Cards	32,000	31,000	55,000	82,000	143,004
Value of Credit Card Transaction (Rs. million)	674	1,057	2,540	3,832	5,303
No. of Debit Cards	0	0	n.a.	59,000	201,650
Value of Debit Card Transaction	n.a.	n.a.	n.a.	n.a.	n.a.
Volume of Direct Credit Transfers (in thousands)[1]	118	211	293	496	834
Value of Direct Credit Transfers (Rs. billion)[1]	148.2	264.2	366.0	619.8	1042.7
Volume of Direct Debit Transfers	n.a.	n.a	n.a.	n.a.	n.a.
Value of Direct Debit Transfers	n.a.	n.a	n.a.	n.a.	n.a.
Others					

[1] *Including few number of interbank large value transfers*

Annex 2

List of Abbreviations

Terms

CBSL	*The Central Bank of Sri Lanka*
SLACH	*Sri Lanka Automated Clearing House*
SLIPS	*Sri Lanka Inter-bank Payment System*
ACU	*Asian Clearing Union*
SWIFT	*Society for Worldwide Inter-bank Financial Telecommunications*
LCBs	*Licensed Commercial Banks*
PDs	*Primary Dealers*
ATM	*Automated Teller Machines*
MLA	*Monetary Law Act*
Rs.	*Sri Lanka Rupee*
Cts.	*Cents: one hundredth of Rupee*
SRR	*Statutory Reserve Requirement*
OMO	*Open Market Operations*
RTGS	*Real Time Gross Settlement System*
MICR	*Magnetic Ink Character Recognition*
EFTS	*Electronic Fund Transfer System*

SLACH Pricing Structure – 2001

	Rate per Unit
Item processing charges	Rs.2.00
Fine sort charges	Rs.0.17
Penalty charges	
a. Rejects on presented Items	Rs.2.00
b. Rejects on drawn Items	Rs.5.00
c. Late Submit	Rs.5.00
Incentive for early submission	Rs.0.25

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Chapter 10

THE PAYMENT AND SETTLEMENT SYSTEMS IN TAIWAN

by

Kuo Hsing Chang*

1. Introduction

1.1 Historical Background

It dated back in as early as April 1982 when domestic banks were urged by the competent authority to complete their nationwide intra-banking linkages starting from deposits to loans and then to giro businesses. These banking giro linkages paved the way to the "CD/ATM Shared System" and "Nationwide Inter-bank Remittance System" launched in 1987. The aims were to construct a nationwide financial service network for inter-bank electronic funds transfer and financial data exchange, so that banks could share common resources, exchange financial information and forge ahead overall automation of the financial services. As a result, the modernisation of the payment and settlement systems in Taiwan has been undergoing a series of transformation from the following constructions:

- **Stage 1 – Intra-Bank's Giro systems (1984-1987);**
- **Stage 2 – Inter-Bank's Remittance systems (1987-2000);**
- **Stage 3 – Central Bank's Large Value Funds Transfer systems (1995-date).**

The payment methods in Taiwan have also evolved from paper-based instruments toward card-based and electronic-based ones. The evolution falls into four stages with each aims toward the same goal, namely, extending the banking services to anytime and anywhere with standard format and security arrangements (See Table 1).

* This paper is completed by teamwork; some materials and contents are offered by related administrative units, it thus represents a collective opinion.

- **Stage 1–Launch auto-banking and deepen ATM/POS function via leased-line;**
- **Stage 2–Launch PC/Phone banking and apply EDI/PKI to EFT via VAN;**
- **Stage 3–Launch E-banking and setup SSL/SET security criteria via Internet;**
- **Stage 4–Launch Mobil banking and upgrade to broadband via GSM/GPRS**

1.2 Legal Framework

A sound legal foundation is the basis of risk control in the payment systems. In Taiwan, the legal framework of payment systems mainly includes the following:

- **Master laws** – refer to "Banking Law", "Central Bank Act", "Negotiable Instruments Act", "Electronic Signatures in Electronic Commerce Law" and its byelaws;
- **Related Laws and Rules** – refer to "Civil Code", "Consumer Protection Law", "Guideline on Consumer Protection in Electronic Commerce", "Fair Trade Law", "Rules Governing the Credit Cards Services", "Security and Management of Criteria for the E-Banking of Financial Institutions", "Law Protecting Computer-Processed Personal Data" and so on.
- **Standard Contracts** – refer to "Master Agreement of Personal Computer & Network Banking Activities", "Standard Service Agreement of PC and Internet Banking", "Standard Contracts for Credit Cards"and so on.

As far as PC and Internet banking were concerned, Taiwan authority passed "**Electronic Signatures in Electronic Commerce Law** " and put it into effect on April 1, 2002. This law is enacted to give legal validity of electronic documents, signatures and media, equal legal status with those of paper-based ones in line with the spirit behind the principles of technology neutrality, free contract and market orientation. Furthermore, the authority stipulated "**Security and Management of Criteria for the E-Banking of Financial Institutions**" amended in 2000. The criteria aims to setup the minimum security criteria to protect on-line transaction by meeting the conditions of confidentiality, integrity, authentication, non-duplication and non-repudiation. Meanwhile, the rights and obligations between e-banking providers and their consumers are subject to "Standard Service Agreement of

PC and Internet Banking". Banks can also choose a sample copy of contract from "Master Agreement of Personal Computer and Network Banking Activities" prepared by the authority in 1999 for the public reference.

1.3 The Role of Government

The government once played a leading role in the process of system design and management of Taiwan payment system so that it would be state sponsored, joint developed, standard unified and resource shared[1]. Since the early 1990s, the role of government has emerged a great shifting toward the market orientation as a respect to the fair competition and the consumer sovereignty. Technology neutrality with non-discriminate and functional equivalent principles applied to the payment innovation so that industry self-discipline and administration neutrality act as the basic tone in the modernisation of Taiwan payment system.

2. Existing Payment and Settlement Systems

2.1 Domestic Payment and Settlement Systems

2.1.1 General Overview

Figure 1 summarises the framework of Taiwan payment and settlement systems as belows:

- **The CBC financial Wire systems (CBC-Wire)**
  - ◆ CBC Inter-bank Funds-transfer System (CIFS): 1995.5
  - ◆ Central Government Securities Settlement System (CGSS): 1997.1
- **Banking Giro Systems** (including TB-Giro, UWCCB-Giro): 1984-87

1. The scenario of these strategies can be summarised as below:
   (1) The government initiates valuable proposals and set up task force to steer the direction of development, to program the required infrastructure, and to support the fundamental research;
   (2) All beneficiary participants are encouraged to develop jointly the infrastructure for common use;
   (3) The specification of system, both in hardware and software, is formulated to comply with an uniform standard, especially to upgrade in connection to international standard;
   (4) As many users should share the resource such as infrastructure and information as possible
   (5) Appreciate market mechanism with fair competition and consumer sovereignty

- **Financial Information Services Value Added Network (FIS-VAN)**
  - Nationwide Inter-bank Remittance System (NIRS): 1987.8
  - CD/ATM shared system (CD/ATM): 1987.1
  - On-Batch payment system (On-Batch): 1990.9
  - IC Card/POS System ¡G1993.8
  - Financial Electronic Data Exchange (FEDI): 1997.1
  - Debit Card/EFTPOS system (EFTPOS): 1998.5
  - Internet shared system (Internet Banking): 2000.2
- **Taiwan Cheque Clearing Houses (TCCH):** 1951.3
- **Funds Transfer for Securities Transactions**
- **Funds Transfer for Foreign Exchange Transactions**

This framework comprises the core backbone, the CBC-Wire; one paper-based banking Giro system, including the TB-Giro; one paper-based cheques clearing system, the TCCH; one value added network for financial information shared system, the FIS-VAN; and funds transfer systems for securities and foreign exchange transactions.

One of the salient features of the structural backbone is that, the message flow is a hybrid mix of Y and V shaped architectures. It reflects the relationship between the CBC and the other two clearing institutions (FIS-VAN and TCCH).

The payment systems in Taiwan are devised under the following principles: RTGS mode for large value fund transfer system and Multilateral Netting mode for retail funds transfer system, to capture the advantages of prompt final settlement in RTGS and the liquidity efficiency in Multilateral Netting.

The share ratios of transactions through the TCCH, FIS-VAN and CBC-CIFS during the 2000 were 15.76%, 32.38%, 51.86% by value and 16.78%, 83.18%, 0.04% by volume. These figures roughly reflected the system structure in Taiwan. From 1995 to 2000, the paper-based cheque declined yearly because of the competition coming from credit cards. In spite of the declines, paper-based cheques are still widely used in Taiwan. According to the regulation of reserves requirement, all banks must deposit liquidities at the CBC, consequently, their daily funds management are finally leveraged through the CBC-CIFS. Therefore, the CBC-CIFS plays the most crucial role in daily operation of Taiwan payment systems.

2.1.2 Payment Methods

Payment methods can be divided into cash and non-cash. Except cash itself with direct finality, all non-cash payments must be settled across banking accounts. The following is a brief overview of payment methods used in Taiwan. More details about the characteristics of payment methods in Taiwan are summarised in Figure 2.

2.1.2.1 Cash

Since Taiwan is a society with high degree of population density and condensed market, cash transaction is still very popular in the ordinary life. Today, currency in circulation includes mainly following denomination of NT dollars: 1000, 500, 100, 50 and coins with par value: 50, 20, 10, 5, 1, 0.5. In 2000, total currency issued registered NT$ 708 billions, of which NT$ 528 billions were in circulation. Among the currencies issued, NT$1000 cash notes took a share 78.55%, NT$500 notes 6.06%, NT$100 notes 6.41%, NT$50 notes 1.18% and other coins together 7.8%.

2.1.2.2 Non-cash Media

- **Paper-based**: Drafts, Promissory Notes and Cheque

Bills of exchange are paper-based strips, including: cheque, drafts and promissory notes, and each one has distinctive features with payment, credit or remittance functions. Drafts possess three functions together, but mainly used as remittance. Promissory notes are largely used as credit guaranty besides payment. Cheque are used to pay at sight, however, post-dated cheque, with due at future date, are also used in Taiwan business transactions. In 2000, the ratios of bills payments to total non-cash payments are 16.7% by volume and 12.4% by value.

- **Card-based**: ATM Card, Credit Card, Debit Card, and Stored-value Card

In Taiwan, banks and some credit card companies can issue several card-based instruments, including: ATM card, credit card, debit card, and stored-value card. ATM Card is in general used for cash withdraw or cash advance with 24 hours services, the advantage of credit card is consumption first and payment later, it also has function of cash advance and credit cycle. Debit card pay by direct debit accounts balances; it amounts to pay

by cash. Stored-value card is used for micro-payments with single-purpose or multiple-purposes, and pays in advance. In 2000, the ratios of ATM card payments to total non-cash payment are 50% by volume and 2% by value, the credit card 26.1% and 0.2% accordingly. The others are trifling.

- **Electronic-based**: ATM, EFTPOS, FEDI, E-Banking, Internet Banking

Electronic-based instruments can be divided into electronic money and electronic funds transfer. The former is a virtual money like digital cash, electronic cheque, or internet credit card, the latter is an access key to logon platform such as ATM, EFTPOS, FEDI, E-banking, internet banking, mobile banking through leased-line, switching center or Internet for on-line transactions. All the funds transfer settlements are executed by direct credit or direct debit across banking accounts. In 2000, the ratios of electronic funds transfer to total non-cash payments are 6.7% by volume and 85.3% by value.

2.1.3 *Structure, Operation and Administration*

2.1.3.1 CBC Interbank Fund Transfer System (CIFS)

Under the CBC-Wire, there are two main subsystems in operation, the CBC Inter-bank Fund-transfer Settlement (CIFS) system, and the Central Government Securities Settlement system (CGSS). The CBC also carries out the administration and operation of foreign exchange (clearing in local currency), treasury; discount window, open market operation, money issuance, economic research and financial statistics compilation.

The CIFS is an on-line large-value fund transfer system, which was launched by the CBC in May 1995. Through CIFS, inter-bank funds transfer can be executed in a real time gross settlement (RTGS) mode and/or in a designated time netting settlement (DNS) across current accounts held by participating banks at the CBC. Acting as the lender of last resort, the CBC connected its CIFS with the FIS-VAN, the TCCH and TB-Giro systems and extended its network to be nationwide. (See Figure 3)

To improve security and efficiency on the large-valued funds transfer, the CBC has reconstructed its CIFS since 1998. The aims were: 1. To implement the RTGS all along the line while current DNS function will be lifted. 2. To develop DvP system for securities settlement while the exist-

ing CIFS system and CGSS system in CBC-Wire will be linked to work simultaneously. 3. To centralise all large value funds transfer into the CIFS.

a. Participants in the System

Any financial institution, whether a bank or non-bank, that holds a current account with the CBC is eligible to access CIFS system subject to the approval of the CBC. At present, the total participants are 129, of which 110 are deposit-taking banks, including local branches of foreign bank, the rest are 15 bills finance companies and others.

b. Types of Transactions Handled

Through the CBC-Wire, the net positions from the cheque clearing (paper-based) system of TCCH and from inter-bank remittance (electron-based) in EFT system of FIS-VAN are settled across the current accounts held at the CBC. Banks use this system to make adjustments of their positions for the reserve requirements, or to settle the net positions coming from the call loan and short-term bills transactions in money market, the government bonds transactions in primary issuing market, and inter-bank transactions in foreign exchange market. The CBC-Wire provides various final settlement services as the lender of last resort.

c. Operation of the System

The message structure of the CIFS is a mix of Y and V shaped architecture. For those who make a direct inter-bank fund transfer through the CIFS system, they follow the V-shaped to send message to the CBC-Wire. While those who send the message first to the FISC-NIRS for clearance, then transfer to the CIFS for final settlement, they follow the Y-shaped mode. It is clear that V-shaped message flow is more efficient than Y-shaped. However, for those bank branches outside the metropolis, and those who make large funds transfer with no direct access to the CIFS, the Y-shaped funds transfer is still a feasible approach to meet their demands.

The CIFS system opens at 8:30 a.m. and runs until 18:20. On-line funds transfer and information inquiry begin at 9:00 a.m. The net positions from cheque clearing in the last business day are settled across the current accounts held at the CBC. The posting is executed at 15:30. The CIFS then executes end-day settlement in DNS mode at 16:00. Beginning at 17:00,

the CBC uploads the netting results from dishonoured cheques clearance and posts the net positions across the current accounts held at the CBC.

d. Transactions Handled

Two types of fund transfer are acceptable in CIFS system, namely: real time gross settlement (RTGS), and the designated time netting settlement (DNS). As of December 2001, the total number of transactions is 37,323 or the daily average 1777. While the total value of transaction is NT$ 12,038 billion and the daily average value is NT$ 573 billion. Average value per transaction was NT$ 0.32 billion. The percentage share of the RTGS, DNS volume to the total fund transfers are 36% and 64% respectively, while 68%, 32% for the value of transitions.

e. Settlement Procedures

Once fund transfers are settled through the CIFS system, they are irrevocable and unconditional. If there is an error committed, the sender has to ask the recipient to carry out an offsetting transaction.

f. Pricing Policies

In principle, the CBC aims to recover the actual operating cost and investment cost of setting up the system. In practice, the payment for the service is charged by volume instead by value of the transaction. Initially, CBC charges every funds transfer for NT$18, of which is equally distributed to the sender and beneficiary banks.

g. Management of Risks

Under the **"Operational Guideline for the CBC Inter-bank Funds Transfer System"**, all participating banks must submit the list of names of those charging in the on-line operation to the CBC for registration. Among those in the list are people who are authorised to screen documents and to issue payment orders. They should be classified into different groups and should not be mixed with the operation. Each bank that wants to access the CIFS system has to key in the User ID and Password assigned by the CBC.

Since existing DNS mode implies potential risk exposure, the system is under reconstruction toward all line in RTGS mode. Under the new RTGS

system, banks encounter serious liquidity pressure in general. To address the potential liquidity problem, the CBC plans to introduce some facilities for risk reduction, which include the intra-day liquidity accommodation, the queue mechanism and the graduated payment schedule as bellows:

- **Intra-day Liquidity Accommodation**: The CBC furnishes intra-day liquidity to help the participating banks in making the intra-day fund transfer speedily and smoothly. If banks want to apply for intra-day liquidity, they must bring out full eligible collaterals, which include the government bonds, Treasury bills, NCDs, CD issued by CBC. Initially, the CBC offers the intra-day liquidity with free of charge. Then, it may charge the liquidity accommodation, which will depend on the system performance.
- **Queue Mechanism**: The queue mechanism is design to follow the by-pass FIFO[2] basis and will keep the payment orders until the deficiency of current accounts is made up.
- **Graduated Payment Schedule**: With queue mechanism, participating banks may hold most of their funds transfer on queue until the truncated time of business day, the CBC thus set a graduated payment schedule to require banks to accomplish their on-line payments at least 50% of total value of transaction on that day before 14:30, and 80% before 16:30 To encourage banks to follow this schedule, the CBC intends to offer a preferential price about 50% discount of the normal charges for those payments completed before 12.00.

2. The by-pass FIFO principle was introduced to resolve the settlement delay problems between financial institutions. If funds are not sufficient, payments are held in queue. Queued payments are executed by the priority, which ranks the first to the fifth in accordance with the nature of fund transfers, then arranged by payment order on a first in first out (FIFO) basis.

As to the priority, there are five categories of funds transfer in the CIFS, namely:

(1) First class: banks' accrued funds transfer to the CBC;
(2) Second class. Banks' accrued bills and checks payable to the CBC;
(3) Third class: banks' net debiting or net crediting balances from the TCCH the FISVAN;
(4) Fourth class: banks accrued payments from the CGSS;
(5) Fifth class: inter-bank funds transfer and other payments.

2.1.3.2 Financial Information Services Value Added Network – FIS-VAN

FIS-VAN is a multi-purpose inter-bank fund transfer network, developed and operated by the Financial Information Services Co. Ltd (FISC)[3]. This system was initially designed for the CD/ATM inter-bank funds transfer and for the nationwide inter-bank remittances by means of Electronic Funds Transfer (EFT). In 1992, the FIS-VAN was added with Electronic Data Interchange (EDI) function and linked to TRADE-VAN to launch the Custom Auto Clearance System for the benefit of the domestic importers/ exporters. The EDI was also applied to the banking finance for the general and business transactions as well as for taxes payments.

With the rapid development in E-commerce, FISC was encouraged by the government authority to develop a shared Internet banking on its Value-Added Network (FIS-VAN). This refers to the systems that enable bank customers to access their accounts and get valuable information on financial products and services through personal computers (PC) or other intelligent devices.

a. Participants in the System

The FIS-VAN is designed for common sharing of resources, such as CD/ATM, EFTPOS, inter-bank EFT, Internet Banking and relevant facilities, to all its members, including domestic commercial banks, local branches of foreign banks, local community banks and credit co-operative associations. This network is linked to other clearing systems like the TCCH and CBC-Wire, or has a strategy alliance with other value-added networks such as Trade-VAN and value-added banks on Internet. The FISC also links to the Joint Credit Information Center for credit information, and has business cooperation with other credit card organisations, i.e. Visa and Master International. This system provides services directly to its member banks, the

3. The predecessor of FISC is the Financial Information Center, which was reorganised from the Financial Information Planning and Design Task Force, set up by the MOF in October 1984 to promote resource sharing, information exchange, and overall automation of financial systems. The Center was a non-profit cyclical foundation, raised by MOF. To enhance the competitiveness of the Center and to upgrade the service quality, the Executive Yuan approved to reorganise the Center from a foundation to a profit legal entity that gave birth to the FISC in November 1998. The FISC is a joint venture company composed of the MOF and other public and private legal entities.

government, the POS merchants, domestic business and manufacture, and the general public indirectly.

Under the FIS-VAN, there are 6 sub-systems for funds transfer services, namely: CD/ATM Shared System; Nationwide Inter-bank Remittance System (NIRS); On-Batch Payment System; Credit/Debit/IC Cards System, Financial EDI System; Shared Internet Banking System. Most of the domestic intra-bank networks and value-added networks were integrated into the FIS-VAN, which also offers payment instruments such as Credit/Debit/IC cards, and information inquiry services like credit records, bounced cheque records and Customer clearance data.

As of the year-end 2000, the CD/ATM shared system involved 415 banks and 14,771 CD/ATM machines with total 47.66 million ATM Cards outstanding; total 448 banks and 6,029 branches took part in the NIRS; There were 22 banks and 8,152 contract merchants with 11,642 POS machines under the IC Card system, of which 12 banks issued 2.61 million cards with credit card function, 18 banks issued 1.21 million cards with debit card function, and 22 banks issued 2.04 million cards with stored-value function; in addition, total 336 banks participated the On-Batch system, 31 banks and 17 value-added networks involved in the FEDI system, and 48 banks shared the Internet Banking system.

In the following, the highlight of each sub-system, including its trading types, transactions handled, and system operation will be presented.

b. Types, Transactions and System Operation

◆ **CD/ATM Shared system**

The shared CD/ATM system is designed toward the goal of one ATM card for all ATM machines. This system uses the Message Authentication Code (MAC) and the Personal Identification Number (PIN) to enhance the security of fund transfer, and protect the users' confidentiality. It opens 24 hours daily all year long, and offers major services such as intra/inter bank and cross-border cash withdrawals and advances, account balance inquiry, inter-bank fund transfer, fund transfer for tax payment. As of the year 2000, total funds transfer through this system reached 222.59 million by volume, and NT$ 3,361 billion by value.

◆ Nationwide Inter-bank Remittance System (NIRS)

The goal of the NIRS system is to integrate the local fund transfer systems into a nationwide union system, so that people can access the system to make fund transfer at any single bank in Taiwan. The business scope of funds transfer includes direct credit to personal accounts, to government accounts, to inter-bank settlement accounts, and to relevant accounts with respect to securities transactions. As of the year-2000, total funds transfer through this system registered 64.12 million by volume and NT$ 76,065 billion by value.

◆ On-batch Payment System

On-batch payment system aims to develop the media transfer, e.g. tape, e-mail for mass routine payments and to reduce the lead-time in computer processing. As requested by the Tax Bureau and other public/private business units, FISC offers tape media batch transfer services for tax, payrolls and dividend bonus payments and accounts management. As of the year-2000, total funds transfer through this system recorded 4.70 million by volume and NT$ 148 billion by value.

◆ IC/Credit/Debit Cards and EFTPOS System

In 1993, the "**Rules Regulating Credit Card Services**" were promulgated by the MOF to liberalise the local credit card market. As a result, the institutions engaging in credit card services were rapidly developed. As of the year-end 2000, there were 55 card issuer banks, 15 card acquirer banks and 8 brands of credit cards in circulation. FISC became the second credit card clearing center besides United Credit Card Center (UCCC). Of the 55 card issuer banks, 34 are members of the UCCC system, 12 belong to the FISC system, and 9 operate on its behalf. As of the year-end 2000, the total credit cards in circulation surged to 18,276,000 from 13,575,000 in the previous year. During the year 2000, total transactions paid by credit cards registered 272.28 million by volume and NT$ 720 billion by value, of which 17.88 million transactions volume and NT$ 56.6 billion expenditures value were ascribed to the FISC system.

The POS/EFTPOS systems enable an IC cardholder to make purchases at the contracted shops through credit/debit funds transfer and cash withdrawal. Meanwhile, this system offers the credit card holder the services, including authorisation, cash advance, lost card service and customer emergency service. As of the year 2000, the total volume and value of transac-

tion paid by debit card and stored-value card were tiny and trifle except the credit card mentioned above.

◆ Financial Electronic Data Interchange (FEDI) System

To promote the EFT in business transactions, FISC introduced the FEDI system. The FEDI facility employs computer-to-computer transmission of financial data such as bills or invoices in a standard format using UN/EDIFACT. This system extends directly its services to customers and thus helps banks to maintain their customer base easier. As of the year-end 2000, 31 financial institutions and 17 value-added networks took part in this system, and more than 2500 users from various field of industries, including electric, information service, transport, importer/exporter, pharmacy and medicine, chemical, and finance, etc. During the 2000, the transactions through FEDI system grew is 224,597 by volume, and NT$244,675 million by value.

◆ Shared Internet Banking System

The Shared Internet Banking System, launched by FISC in February 1999, is an electronic payment system using the SET standards[4] for E-commerce purpose. This system aims to extend the banking services to its client's site to provide convenient and secure service to the public. Through this system, on-line payment services for B2B, B2C and inter-bank transactions are provided through Internet, and link banks with the clearing houses, certificate authorities, merchants and consumers for sharing of the financial resources.

The Internet is an open network, through which on-line transactions and payments are protected by security arrangements such as SET and SSL[5].

4. Secure Electronic Transaction (SET) is a security protocol for Internet transaction. This protocol was jointly drawn up by Master and Visa credit card organisations in 1996, and supported by technology providers such as Microsoft, Netscape, IBM, GTE, Verisign. Originally SET is developed to offer a standard TCP/IP for credit card payment through Internet channel; it is used with digital signature and certificate identification to protect data privacy and message authentication.

5. Secure Socket layer (SSL) is a security mechanism, developed by Netscape for Internet browser application. It is an encrypted communication protocol between end-user and Web server to protect the information or message flows from eaves dropping, tampering, and forgery. As a whole, SSL is less secure than SET, but it cost cheaper in installation and more convenient in utilisation. It is well suited in small value payment of Internet on-line transaction.

The Taiwan authority has constructed the Public Key Infrastructure (PKI) and opened the setup of Certificate Authority to charge itself with the management of the master key. To prevent money laundering and fraud, the maximum value per transaction is limited to NT$2,000,000 (amounting to US$ 60,600). As of the year-end 2000, the total transactions through this shared Internet banking system recorded 145,457 transactions by volume and NT$1,128 million by value.

c. Settlement Procedures

At the beginning of business day, all the participating banks of the NIRS make funds transfer from the current accounts held at CBC into the No. 87[6] Accounts, which are used as guarantee funds for the liquidity demand in the NIRS and shared CD/ATM systems. Incoming and outgoing payments as well as transfers to and from the NIRS system continuously update the clearing balances held in the No. 87 Accounts. The No. 87 Accounts are not allowed to have negative position. Also FISC should not touch and move the balances for its own purpose. In practice, this account is under the management of the CBC.

d. Pricing Policies

According to "**Guideline on the Establishment and Management of Inter-Bank Financial Information Service Provider**", the providers are required to submit the costs formula to the MOF for approval before charging the fund transfer services. Any change or adjustment on the charges must follow the same process.

The service charge of the NIRS system depends on the value of fund transfer. The basic charge is NT$10 for funds transfer under NT$2 million per transaction. For every additional NT$1million, it charges another NT$5, for example, from NT$2 million to NT$3 million, it costs NT$15, and from NT$3 million to NT$4 million, it costs NT$20.

For the inter-bank fund transfer through CD/ATM system, FISC charges the sender every transaction for NT$4.5 regardless of the value.

6. The No. 87 Accounts are in essence a set of guarantee funds, providing FISC for inter-bank funds transfer clearance. The proprietary rights of No. 87 Accounts belong to the CBC, while the accounts' balances belong to the participating banks.

e. Management of Risks

In the NIRS system, payment orders are executed only if there are sufficient guarantee funds in the No. 87 Accounts. CBC offers daily liquidity for the smooth operation of the NIRS, FISC has little credit risk in operating the NIRS system.

2.1.3.3 Taiwan Cheque Clearing Houses – TCCH

The paper-based cheque clearing system, operated by the TCCH, is composed of 16 clearing houses, including Taipei Clearing House. Under this system, there are two subsystems: one that takes charge in collecting and clearing cheques and another one that establishes databank and replies to cheque credit inquiry.

To improve the clearing of cheque, the Taipei Taichung and Kaohsiung Clearing Houses sequentially introduced magnetic ink character recognition machines (MICR) to speed up the clearing process in 1985, 1994, 1997 respectively. Currently, the clearing cheques processed on ordinary day reaches an average of 694 thousands cheques, and may reach 1,200 thousands at the peak day. Most cheques are collected and cleared at the three big cities, namely: Taipei, Taichung and Kaohsiung located at the top, middle and bottom of the island, respectively. These clearing houses clear about 76% of the total exchange cheques. There is a plan to link these three big clearing houses and create a nationwide network for paper-based cheques clearing. Under this plan, paper-based cheques will be collected and exchanged by each local clearing house, centralised clearance at the Taipei Clearing House and centralised settlement at the CBC.

To strengthen the cheque credibility, the Taipei Clearing House started in 1987 to disclose the information on dishonoured cheques and the credit records of natural/juridical person who were banned from opening checking accounts. Relevant information is now available on the Cheque Credit Inquiry Network, established by the Taipei Clearing House. All members who participate in the TCCH can share this information. The cheque credit information now can be accessed directly through the telephones and Internet.

a. Participants in the System

As of the year-end 2000, a total of 91 banks (including 48 commercial banks, 39 foreign bank branches, 2 development and investment banks, 1 Postal Remittance and Saving Bank and the Central Bank of China) and 367 local credit institutions (comprising 56 credit co-operative associations, 284 credit department of farmer's associations and 27 credit Department of fishermen's associations), are participating in the TCCH and engaging in the bills of exchange on behalf of its clients.

b. Types of Transactions Handled

In Taiwan, cheques are the most widely used payment instruments aside from cash. There are three types of exchange items in circulation, namely: promissory note (including Bank promissory note), draft (including bank accepted draft), and cheques (including Treasury Cheque). Among these cheques, there are also bank guarantee cheque and marked cheque for the use under a designated purpose.

c. Operation of the System

In Taiwan, clearing houses are set up to clear cheques and deal with dishonoured cheque records, including compilation of credit information database for public request.

The clearance of paper-based cheques refers to the exchange of cheques between financial institutions for settlement carried out by the TCCH. As far as Taipei Clearing House is concerned, all the exchanged cheques must be sent to the local clearing house before 6.00 p.m. for overnight clearing. It takes 3 hours (or 9 hours at peak day) to sorting and read that data after which it is transmitted to the mainframe computer in the Taipei Clearing House to sum up the credits for each presenting bank and debits for each paying bank. The report and sorted physical cheques will be sent to each paying bank for posting to their client's accounts (debiting the issuer's account). The net balances will also be stored in the media tape and sent to the CBC before 9:00 a.m. for final settlement at 15:30 on the following business day.

If the balance is insufficient, the cheque will not be paid and will be returned to the presenting bank, then to the depositing customer with "**Notice of Dishonoured Cheque**" attached to it. The data relating to that

cheque must be transmitted back to the Taipei Clearing House before 16:30 on the same day. The Taipei Clearing House will then make the necessary adjustments on the debits and credits of the paying and presenting banks involved and transmits the statement to the Central Bank for re-settlement at 17:00 on the same day.

For the cheque credit information service, inquiries can be made either at the bank branch office or at the local clearing house. Presently, there are 4,204 branches and 16 clearing houses throughout the country. Historical records of personal credit status are stored and compiled at the Credit Information Database, covering 4 million basic data on checking accounts and 14 million dishonoured cheques records throughout Taiwan since TCCH started operating. The TCCH offers the following data for request.

- Whether the subject under inquiry is a "refused account holder";
- How many dishonoured cheques drew by the subject under inquiry during the last three years.

d. Transactions Handled

The TCCH processes about average 694,000 cheques on an ordinary business day and 3,200,000 cheques on the peak day. In addition, it replies on an average of 19 thousand inquiries for cheque credit information.

e. Pricing Policies

The Taipei Clearing House is a non-profit organisation and charges the participating banks at a rate approved by the CBC. The principle used in the pricing of the service is to cover its long-term fixed investments and the regular operation expenditures. In general, clearing services are charged in accordance with the type of sorting. There are three types of sorting, namely: Type A is sorting by name of paying bank, for which TCCH charges NT$ 0.4 per cheque, Type B is sorting by name of paying bank branch and charges NT$0.6 per cheque, and Type C is sorting by account number, for which NT$ 1.2 per cheque is imposed to the paying bank.

For cheque credit information service, the TCCH charges every inquiry of NT$ 50 for the bounced cheque records of the last 12 months, NT$ 100 for the last 36 months and NT$200 for the details of the dishonoured cheque records of the last 36 months.

f. Management of Risks

The cheques clearing house often deals with the credit risks by guarantee funds, same day settlement[7] and rewind arrangements.

2.2 Funds Transfer for Securities Transactions

The financial markets in Taiwan are composed of long-term equity market and short-term bills market. The former can be divided into primary issuing market and secondary trading market. Current investment instruments circulating in the equity market include listed/quoted stocks, corporate/government bonds, financial debentures, beneficiary certificated, TDR and warrants with maturity of more than one year. The latter is referred to as a market place, which provides the functions of raising short-term funds for working capital adjustment, including securities and money market instruments with maturities of less than one year.

Except for the short-term bills, the government bonds and the listed/quoted stocks in Taiwan have been dematerialised or immobilised, and both finally settled by book-entry processes since 1997. Moreover, the government bonds transactions are settled through the CIFS system by EFT, and Central Government Securities Settlement system (CGSS) by book-entry. While the equity transactions in centralised equity market (TSE) or over the counters (OTC) are settled through UWCCB Giro system by EFT and Taiwan Securities Central Depository (TSCD) by book-entry.

The following briefly overviews the long-term equities markets and the short- term bills market in Taiwan, of special interests focus on the related payment and settlement procedures.

2.2.1 Central Government Securities Settlement System: CGGS

As the fiscal agent of the Treasury, the CBC takes charge of government the bonds' issuance, distribution, custody, registration, redemption, and interest payments. In September 1997, the CBC launched the Central Government Securities Settlement system (CGSS) to facilitate the issuance and

7. In Taiwan, people used to present their cheques to banks one day before the due date. After processes of cheque exchange, the cheque clearing and settlement will be executed at the same day, that is, at the due day.

circulation in government bonds primary market. In October 2001, the OTC introduced the "Comparison System" with its well-established "Electronic Bond Trading System" to improve the auto-match efficiency and to match with the construction of yield curves. The transactions of government bonds in the OTC market are cleared by netting through the settlement banks and finally settled by book-entry through the GSCC system (See Figure 4).

As of the year-end 2000, 71 dealers take part in the CGSS system for auction, distribution and underwriting of the government bonds in the primary issuing market. In addition, there are 17 settlement banks and 20 undertaking banks with a total of 2,367 branches involved in this system.

The CGSS offers final settlement with book-entry for all related transactions of government bonds, including the bonds issuing, underwriting, buying and selling with outright and RP condition. In practice, banks buy government bonds for their liquidity reserve requirement, bills finance companies for their RP/RS operation and business entities for their warranty of public infrastructure auction.

Government bond market grew rapidly in recent years. For primary market, new issuance of government increased from NT$ 283 billion in 1999 to NT$ 363 billion in 2000 or by 28%. For the secondary market, the total bond trading increased from NT$ 20,802 billion in 1995 to NT$ 68,354 billion in 2000 or an average yearly growth rate of 18%. Of the total bond trading, 99% are government bond of which 76% are Rp/Rs transactions while the rest are outright contracts.

Most of the transactions of government bonds in the primary market are settled through the CBC-Wire, of which bond transfer is settled through CGSS and funds transfer through CIFS. To reshape into DvP system, both the CIFS and the CGSS will be linked to work simultaneously.

As to the fee for the government bond book-entry service, it charges the same way as those in the inter-bank fund transfer from the government bond transactions. It also charges the seller NT$110 for every transaction with value under NT$ 10 million. Of the NT$ 110, the CBC obtains NT$ 30, the rest is distributed to the seller's settlement bank. For the transaction valued above NT$10 million, it charges additional NT$ 60 for every additional NT$ 10 million transaction. The additional NT$ 60 is distributed between the CBC and seller's settlement bank; the share ratio of the CBC is one third. The fractional balance will be looked as a basic unit,

e.g. NT$ 10 million, and the fee will be similar. Nonetheless, the service charge will be limited to NT$ 350.

2.2.2 The UWCCB Giro and TSCD for Equity Transaction Clearing

As of the year-end 2000, a total of 531 listed companies and 337 quoted companies have issued and circulated their shares in the centralised exchange market of Taiwan Stock Exchange (TSE) and the Over-the-Counter (OTC) markets. The securities firms are the major service suppliers, which include brokers, underwriters and dealers. In 1988, the MOF revised the "**Securities and Exchange Law**" to open up the licensing application to new securities firms. As a result, the number of securities firms has surged quickly. As of the year-end 2000, the number of securities firms reached 190, including 158 brokers, 105 dealers and 75 underwriters. The other major service suppliers in securities market are the 38 securities investment trust companies (SITC) and 238 investment consultant companies. The total value of transactions reached NT$ 30,817 billion in the TSE and NT$ 73,400 billion (mainly involving the governments bonds transactions) in the OTC.

As for the securities settlement, the Taiwan Securities Central Depository Company (TSCD) was established in 1990 to deal with the securities custody and book-entry management. At present, it is compulsory for investment accounts in local securities firms to join this book-entry system for the trading of listed or quoted stock, which are by and large immobilized to promote the efficiency and safety of securities settlement. One of the objectives in adopting the book-entry system is to prevent the securities from counterfeiting, falsifying, and delivering risks and at the same time to improve the efficiency of transactions and security of custody.

All stocks and bonds are traded either on the trading floor of TSE or on the OTC market with life cycle T+2. Once deals completed, settlement is made by book-entry delivery; and funds transfer settlement between security companies and TSE is executed through the banking Giro systems designated by the TSE, of which mainly the TB-Giro and UWCCB-Giro. While those between securities companies and the general investors are settled through **UWCCB-Giro** mainly. This giro was initially developed and operated by a private bank, the United World Chinese Commercial Bank (UWCCB). Similar giro systems developed by Fubon Commercial Bank and other followers have emerged to compete with the UWCCB-Giro. Un-

der these giro systems, UWCCB and its followers post all fund transfers from securities transactions across the deposits accounts between investors and its corresponding securities companies. In fact, the UWCCB plays the clearing agency for the securities companies. In general, the settlements are processed by media exchange or on-batch payments.

All the clearing services offered by these giro systems are free of charge, because they absorbs huge flow of funds from the daily transactions in the equity market and makes profits from the interest spread between checking deposits interest rate and the call loan market interest rate. On the other hand, the equity transactions in Taiwan capital market are not subject to any other tax except the stock exchange tax, which is 0.3%(when sell), while the commission of security company is around 0.1% of the transaction value.

2.2.3 The Short Term Bills Clearing System

The money market in Taiwan is composed of short-term bills market and inter-bank call-loan market. There is no physical central market place for short-term bill transactions; which are made mainly by bilateral negotiation through telephone, telex, and facsimile.

The call loan market provides overnight credit to the banks for fund shortage in their required reserve positions, so that banks could lend the excess reserve to other banks and adjust the fluctuations in their reserve balance. On the other hand, the major instruments traded in the short-term bills market include: treasury bills, commercial papers, banker's acceptances, negotiable certificates of deposits (NCD) and long-term securities with maturities of less than one year. As of the year-end 2000, the market participants include 61 banks, 16 bills finance companies, 4 securities finance companies and 3 investment and trust companies. Among these institutions, the bill finance companies play the most important role in matching the trading through repurchase or outright operation. In addition, the annual total trading value of the inter-bank call loans market reached NT$9,535 billion while the short-term bills market amounted to NT$ 63.915 billion, of which 89.09% is commercial papers and 9.6% is NCD. Both constituted the major instruments in the short-term bills market. The centralised clearing system (in process) will make this large-scale market transaction with book-entry processing.

The bill finance companies used to engage in a very high leverage operation in short-term bills market and call loan market to make idle funds more productive. In the past, the CBC agreed to allow the bills finance companies to take part in the CIFS system, the aim is to facilitate the performance of the open market operations. Since the bills finance companies are not considered as deposit-taking banks, they have no reserve deposits accounts with the CBC and most of their working capitals also come from the call loan market or from the repurchase operation of the bonds and commercial papers in money market. In the actual operation, almost all the Rp/Rs transactions operated by the bill finance companies are settled in DNS through the CIFS system, especially at the end of the business hours.

To improve the lead-time lag implied in the short- term bills settlement, the government plans to construct the short-term bills clearing center and bills centralised custodian. At the same time, bills clearing will be executed in a centralised book-entry system.

2.3 Cross Border Payments

Taiwan is an export-led country; the cross border payments from exports and imports are mainly executed by means of D/A (Delivery against Acceptance), D/P (Delivery against Payment), O/A (Open Accounts) and T/T (Telegraph Transfer), among which T/T is now the most popular way used in international trades, especially in Taiwan high-tech industries. All the related messages transfers are transmitted through the SWIFT.

Taiwan does not have a centralised clearing center for foreign exchanges settlement. The foreign exchange market used to be a trading network instead of the fixed marketplace, where the buyers and sellers of various currencies may place bid/offer prices. The foreign exchange transactions are executed through telegraph, telephones, facsimile, telex and other electronic equipment. In practice, on-line place orders and deals making in the foreign exchange market are processed through the **Reuter** leased line, while the worldwide financial markets and prices information is subscribed from the **Bloomberg** or Reuter, and payment orders or messages are transmitted through the **SWIFT**. The SWIFT has a wide application in the cross-border funds transfer because of its system reliability. Finally, all cross border funds transfer must be settled through the accounts of the correspondent banks, including the Off-shore Banking Units (**OBU**), domestic authorized foreign exchange banks (also called **DBU**), or oversea branches of domestic banks.

The foreign exchange market in Taiwan consists of two major sub-markets, namely **bank-customer market** and **inter-bank market**. The former provides enterprises or individuals the facilities to conduct foreign exchange transactions with "authorised foreign exchange banks", having the approval of the CBC to engage in the foreign exchange operations. The latter is composed of 78 authorised foreign exchange banks, 2 foreign exchange brokers and the CBC. In the inter-bank foreign exchange market, the bank could undertake foreign exchange transactions to square its foreign exchange position, to make inter-bank foreign exchange call loans, and to conduct relevant derivatives transactions for hedging foreign exchange risk (See Figure 5). The Inter-bank trading could be executed between the two parties or through the match order of the broker, and the buyers and sellers could freely negotiate the rate of foreign exchange transactions. To enhance the banking position management and risk control, the MOF announced the **Guideline of Derivatives Operations by Banks** on April 25, 1995, for the foreign exchange derivatives operations through the OTC market.

As of December 2000, the net turnover of total foreign exchange transactions in the Inter-bank and bank-customer market amounted to US$ 110.34 billion, of which 56.6% was for the inter-bank market. In inter-bank foreign exchange, about 78.4% of the transactions were through direct dealing while the rest were matched by the broker. In the foreign currencies transactions, the US dollars account for the 89.4% of the transactions while the rest are mainly for the Japanese Yen and Hong Kong dollars. Moreover, the total value of contracts in the foreign exchange derivatives traded by banks amounted to US$ 42.49 billion, including US$ 16.22 billion for foreign exchange swaps, US$ 9.45 billion for outright forwards, US$ 2.61 billion for margin account trading, US$ 0.34 billion for currency swaps and US$13.87 billion for options. Financial derivative contracts traded by the local branches of foreign banks accounted for 90% of the total market share.

Most of the foreign currencies transfers (cross border payments) in foreign exchange market are settled through bilateral netting between the trading partners, including DBU, OBU and overseas branches of domestic banks. While the final net position (NT$ against foreign currencies) are squared through the NIRS system or CIFS system at the end of the business day.

3. The Implications of the Existing Payment Systems for Financial Stability

3.1 Timely Information

The payment systems, monetary policy, and prudential supervision, are the core functions of the central bank to maintain financial stability.

From the current accounts, the CBC watches the liquidity position changes of the participating banks, as a whole or individually, and judge whether the financial stance is tight or loose. The patterns of the net position in current accounts can be a useful indicator for risk control. Normally, risk exposure in funds transfer results from payment floats (debit or credit), which can be addressed by timely intra-day liquidity policies conducted by the central bank. On the other hand, payment system generates timely information that may be used as pre-alarm signals by the central bank to watch and supervise the operation of banks individually or as a whole. This liquidity facility is now added in the new RTGS system. The pre-alarm system is useful to ensure that the policy interactions among payment system, monetary policy and prudential supervision are harmonious. Moreover, it is required to establish a formal mechanism to reinforce the regular connection and the information sharing among those responsible for the payment system, monetary policy and banking supervision.

3.2 Effectiveness of Monetary Policy

The CBC adopts monetary targeting mechanism to achieve its macroeconomic goals. The broad monetary aggregate, M2, is chosen as the intermediate target variable. At present, the functioning of this targeting mechanism remains effective.

The principle reason for the CBC to adopt monetary targeting lies in the fact that the demand for M2 remains stable in general, so that it can be used to indicate whether the intended policy results will be realised and whether the ultimate goals will eventually be attained.

Although intermediate targeting has its advantages, the process from the beginning of the policy operations to the realisation of the ultimate goals involves a time lag. In order to response to the changing environment, the CBC has to keep abreast of the economic and financial conditions and adopt appropriate and effective measures. Financial indicators that contain timely

information become very important to policy-making. In this regard, the payment systems can generate useful and timely information to improve policy formulation.

The CBC also concerns with the impacts from the payment innovation on the effectiveness of the monetary policy implementation, especially the e-money and e-payment. Related statistics are now in process of compilation.

3.3 Prudential Supervision

According to newly revised **Banking Law 47-1, 47-3**, the Ministry of Finance is the competent authority of the credit/stored-value card, PC/Internet Banking and inter-bank funds transfer services except the CBC-Wire, while the CBC is authorised by **Central Bank Act 32** to enact rules and regulations governing the operation of cheque exchange and inter-bank funds transfer. Thus, the payment systems in ROC are under consolidated supervision by the CBC and the MOF. The implementation of consolidated supervision is also under the structure of division of duties in banking examination[8].

As regards payment system oversight, the CBC acts as an operator and regulator of the inter-bank funds transfer system in Taiwan. The CBC has the monitor to watch the operation of payment systems, including the CBC-Wire, FIS-NIRS, and TCCH, of which the CBC also offers the final settlement and the last resort services. Besides, the CBC has the power to watch the issuance of E-money, credit cards, or the banking giro operation for the purpose of financial stability.

4. Fair Competition, Innovation and Consumer Protection

In the newly revised "**Operational Guideline for the CBC Inter-bank Funds Transfer System**", the CBC begins to open its CIFS system for those who plan to engage in funds transfer services if the following crite-

8. Under "Rules Governing Division of Duties in Banking Examination" announced by the Executive Yuan (the Premier Administration) in October 1999, the CBC and the MOF were entrusted to examine (on-site as well as off-site) the banking institutions (domestic and oversea) respectively. Besides, the CDIC is assigned by the competent authority to examine the local community banks, such as credit cooperatives and credit departments of farmers and fishermen associations. Based on the said rules, examination units should also comply with the related regulations issued by the CBC and the MOF on the payment system oversight.

ria are satisfied with:

- Well-founded rules and procedures of system operation;
- Open information enable a clear understanding risks and obligation;
- Clear risk control arrangements;
- System arrangements ensure the same-day settlement;
- Open and fair access criteria;
- Backup facility and operational reliability and security.

Above access criteria basically comply with the **Core Principles 1, 2,3,4,7,9,** issued by CPSS in the Bank of International Settlement in the early 2001.

The construction of the PKI in Taiwan is an important policy to encourage the payment innovation, while "**Electronic Signatures in Electronic Commerce Law**" underlies the PKI. Instead of presetting regulation on the RA/CA management, the legislation of this law is attempting to open the RA/CA businesses so that encourages the private industries to develop their technique integration as concerned as possible.

In Taiwan, there is no single consumer protection law specialised in the payment and settlement. The related regulations mainly come from the expansive interpretation of "**Consumer Protection Law**" and its **By-Law** promulgated in 1994. For example, the article 32 in the "**Operational Guideline for the CBC Inter-bank Funds Transfer System**" clearly stipulates that the clearing service provider must protect its clients without against the "Consumer Protection Law", of which the consumer is protected by standard contracts with the principle of equal reciprocal treatment.

To enjoy the consumer's confidence with E-commerce, the Consumer Protection Commission devised "**Guideline on Consumer Protection in Electronic Commerce**" and reinforces the protection of Internet consumers, of special emphasis focused on the payment security and privacy protection. Under "**Law Protecting Computer-Processed Personal Data**", Internet banking also requires a license for personal data collection.

5. Recent Developments of Payment System and Policy Initiatives

Payment systems in Taiwan are still in the process of reconstruction. The CBC has embarked on reshaping its CIFS toward RTGS system, reforming its CBC-Wire toward a DvP-based system and centralising all the large value funds into the CIFS system. The government plans to develop

short-term bills centralised custody and clearing system in D-v-P settlement mode. The Taipei Clearing House is undergoing reorganisation and plans to link with its local clearing centers to come up with a nationwide network for cheque clearing and ACH systems.

5.1 To Reshape CBC-Wire toward Deliver-verse-Payment System

The system risks are usually coming from the failure of large value funds transfer system. To improve the security and performance of the payment systems in Taiwan, the CBC has been reshaping its CBC-Wire. The major reforms of CBC-Wire are summarised in the following:

- Abolish the DNS function and upgrade the RTGS by introducing queuing mechanism, intra-day liquidity facility and graduated payment schedule to improve the performance of the CIFS system;
- Linking with Government Bonds Book-entry System and the forthcoming short-term bills central depository and clearing system (in progress) toward the Delivery-versus-Payment system;
- All large value funds transfer henceforth will be centralised clearing through the CIFS system in the CBC-Wire

5.2 To Develop Bills Central Depository and Clearing System

Most of the transactions in the money market are indirectly settled through the CIFS system. For example, most of the local branches of foreign bank buy and sell New Taiwan Dollar from the inter-bank call loan market, they make deals and clears through the TB-Giro, but final funds transfer are settled across the current accounts they held at the CBC.

Since settlements from bills transactions are usually large value funds transfer, the buyer and seller in the money markets may be exposed to principal risk. Potential credit and liquidity risks may also occur in the process of fund and securities settlement that are usually cleared at the end of the business day on a T+0 cycle. In absence of a fixed bills marketplace, all deals are made with bilateral negotiation so that it is difficult to control the float lag. To address the float problem, the government plans to develop a bills clearing center and establish the bills centralised custodian.

5.3 To Integrate Cheque Clearing Houses and Provide ACH Services

Paper-based cheque is still the favorite payment instrument and has been wildly used in Taiwan's business circle. Inspired by the idea on how to improve the cheque clearing efficiency, the TCCH constructed the nationwide cheque clearing system to shorten the delivery lag. Also, the Taipei Clearing House has planned to link with other 15 local clearing houses into a nationwide cheque-clearing network. This network is basically built on a triangle backbone with computer-to-computer linkage among the Taipei, Taichung and Kaohsiung offices. When system completed, it is expected to speed the clearing process in accordance with the principle of **local cheque exchange and national centralised clearance and settlement**. One salient features of this network is one system, three processing centers, which support the system and backup each other, and provide new services of Automatic Clearing House (ACH).

6. Suggestions and Recommendations on the Role of Central Bank

As one of payment system operators and regulators, the central bank needs to take a perfect foresight in response to the possible challenges from the fast changing payment environment. The perfect foresight may results from the process of learning by doing. From the facts found in this report, some suggestions can be drawn as bellows:

- Examines the current payment and settlement system to comply with the "Core Principles" as recommended by the CPSS. It would be better to develop an advance and workable methodology to realise the core principles.
- Promotes the status of current payment and settlement division and expands its organisation to involve human resource with specialisation in information technology.
- Reinforces the basic research on the payment system and monetary policy. Recent information technology advances forged the association of the front office with back-office to a complete one system. Payment system should not be looked as an accounting paper work only; it can play an active role in the implementation of the monetary policy.
- Compiles the relevant statistics on the payment and settlement system to understand the real situation and its potential to develop new payment instruments, so that judgment can be made on their impact on the existing monetary definition and transmission mechanism.

- Builds a pre-warning system to monitor the system operation for timely diagnose of any abnormal situation in the systemically important funds transfer systems.
- Reinforce the international communication and cooperation in the supervision of the cross-bordered funds transfer system. The Internet revolution has changed the business mode toward global logistic and banking finance without frontier. New technology has change the old world; hence new rules are needed for new games.

Figure 1 - Payment and Settlement Systems in ROC

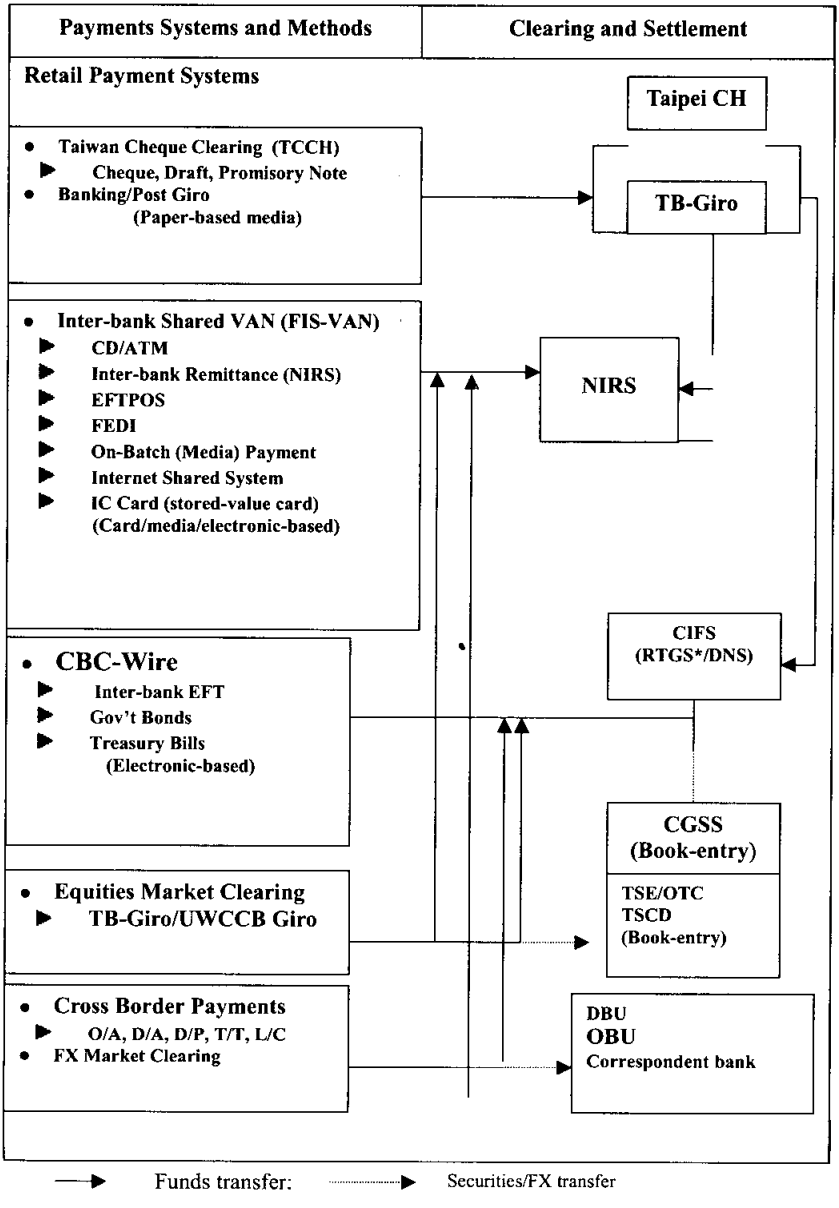
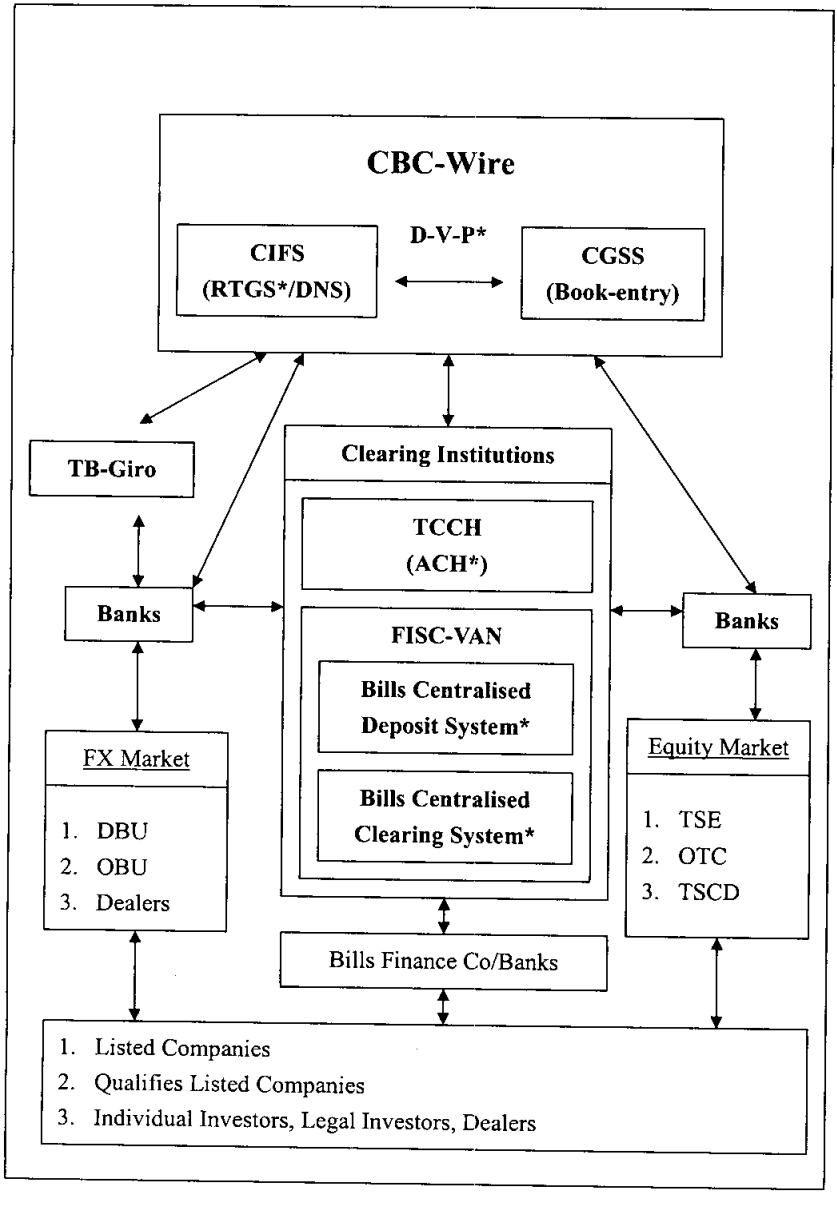


Figure 2 – Summary of Payment Methods in ROC

Payment Media	Functions	Payment Characteristics	Operating Institutions	Settlement Cycle
Cash	Payment/Account Unit /Store Values	Face-to-Face Anonymous	CBC	Real time
CBC-CIFS	Inter-bank EFT Call Loans Settlement Fex Settlement Gov't Bonds Settlement	Leased line Direct Credit Access: User ID and Password	CBC	RTGS: Real time DNS: T+0
Bills of Exchange	Payment/Credit/ Guaranty /Discount/Underwriting Negotiation	Present/Collect Exchange/Clearing Posting/Settlement	Banks Cheque Clearing Houses (TCCH)	Present at due date: P+1 interest bearing P+2 funds movable
ATM Card	Deposit cash Withdraw cash Funds Transfer Balance Inquiry	ATM platform 24 hours service Access: PIN/Password	Banks FIS Co.ltd.	Consumer: real time bank¡GT+0/T+1 with switching date at 15:30
Credit Card	Credit Consumption Cash Advance Credit Cycle Accident Insurance Lose Registration Emergency Services	POS platform Identification: shops Authentication: shops Authorise: Magnetic card: on-line IC card: off-line	Banks UCCC FIS Co.ltd. Credit Card Co.	Consumer¡GT+30 Shops¡GP+1 to P+3 * Banks¡GP+0/P+1 with Switching date at 22:00
Debit Card	Debit Consumption Balance Inquiry	EFTPOS platform On-line direct debit	Banks FIS Co.ltd	Consumer/shop: real time Banks: P+0/P+1 with Switching date at 15:30
Stored-value Card	Pre-paid Consumption	On-line\off-line process Micro payments	Banks FIS Co.ltd.	Real time
FIS-NIRS (EFT)	General EFT Treasury EFT Inter-bank Remittance Securities EFT	Leased line/Switch line Direct debit/credit Access: PIN/MAC	Banks FIS Co.ltd.	Payer/payee: real time Banks: T+0
On-Batch ACH*	Automated Clearing for Utilities/Taxes/Fees/ Payrolls/Dividend bonus /Pensions/Taxes Refund	Media exchange¡G E-Mail\Tape\Disk Batch process Routine Payments	Banks FIS Co.ltd. TCCH	Consign unit: Payer agent: P+4 Payee agent: P+1/P+2
FEDI	On-line Transactions EFT Information Exchange And Communication Home Banking Firm Banking	Leased line/Switch/VAN Security control: SSL, Master key, E-signature Message authentication: E-document form control Transaction ordering No.	Banks FIS Co.ltd.	Payer/Payee: real time Banks¡GT+0/T+1 with Switching day at 16:30
Internet Banking Shared System	Internet Shopping Internet Place Orders Internet EFT Internet Taxes/Fees Payment CA application/Renew	Internet/payment gateway Security control: SET, PKI, E-signature Message authentication: RA/CA,	Banks FIS Co. ltd	Payer/Payee: real time Banks: T+0/T+1 with Switching date at 15:30

Note: P+2 refers to two days after presenting date. T+1 is one day after trading date
Sources: Author compiles.

Figure 3 - System Architecture in CBC-Wire



* means under reconstruction.

Figure 4 – Central Government Security Settlement System

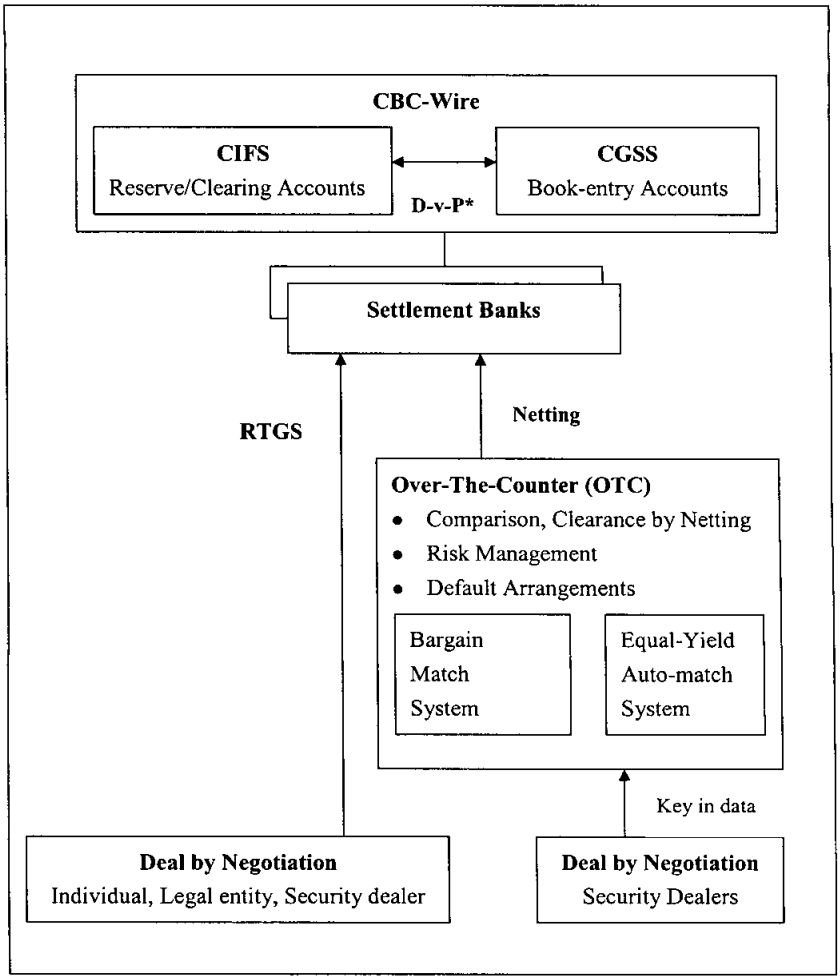
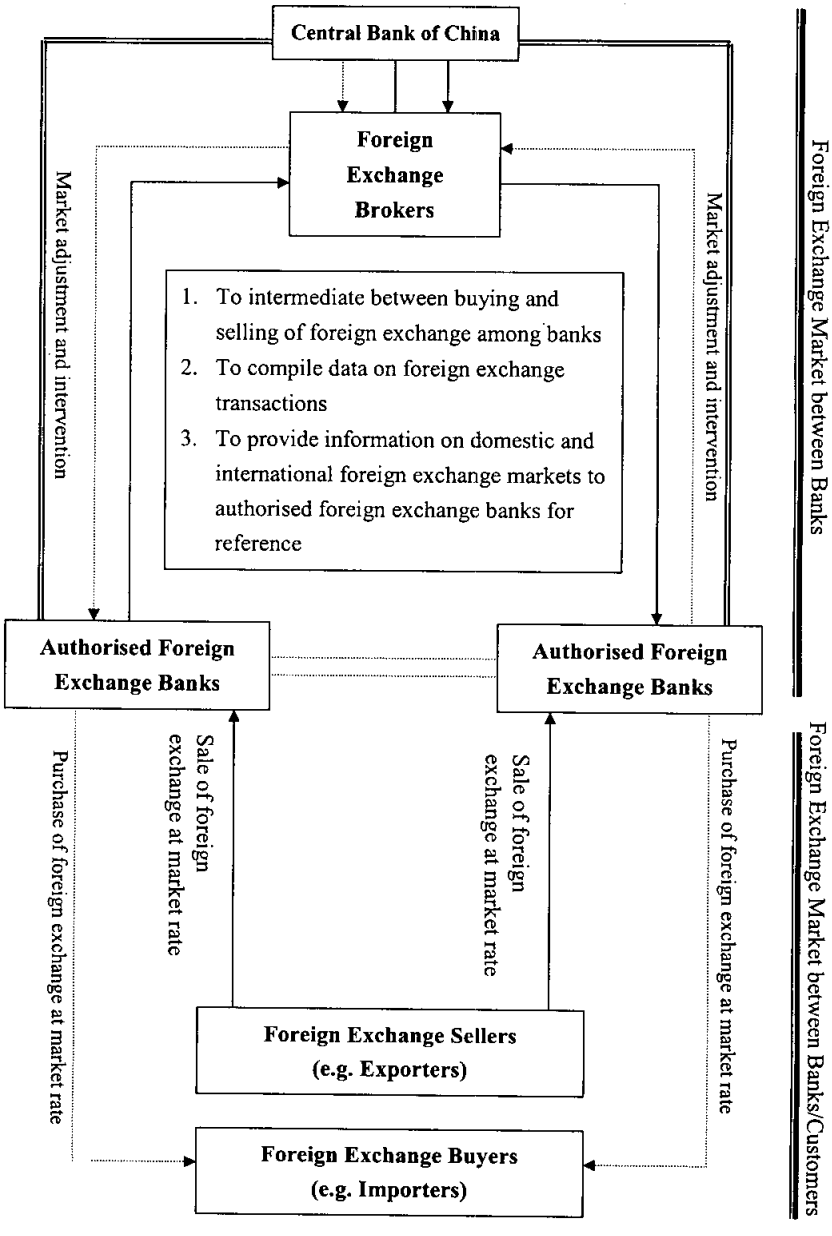


Figure 5 - Organisation Chart of Foreign Exchange Market in the ROC



Country Tables

Table 1. Major event affecting the payment and settlement systems

Date	Major Development
Mar. 1951	Launch Taipei Checks Clearing House (TCCH)
July 1977	Bank of Taiwan introduced Taiwan's first Cash Dispenser machine (CD)
April 1982	The MOF required banks to complete their intra-bank giro system before 1987
Feb. 1984	ICBC introduced Taiwan's first Auto Teller Machine (ATM)
Jan. 1987	FISC Launched Shared CD/ATM System for inter-bank cash withdrawal
Aug 1987	FISC Launched FIS-NIRS System for Nationwide Inter-bank Remittance (NIRS)
Sep. 1990	FISC Launched On-Batch System for tax/securities/payrolls EFT
Aug.1993	FISC Launched IC Card Service System for credit consumption
Dec.1993	FISC Deployed POS with credit card function
Mar.1994	FISC Extended ATM to cross border payment (CIRRUS/PLUS/Maestro)
Mar.1994	MOF opened Phone Banking
May 1995	CBC Launched CBC-Wire for inter-bank large value funds transfer (CIFS)
Jan. 1997	FISC Launched FEDI System
July 1997	MOF open virtual securities dealers for on-line place orders in equity market
Sep. 1997	CBC launched Central Government Securities Settlement System (CGSS)
Oct. 1997	Domestic bank began to build its WWW site over Internet
May 1998	FISC Introduce debit card function into the EFTPOS system
May 1998	Domestic banks launched PC/Internet Banking by Turnkey
Feb 1999	FISC Co. Launched shared Internet Banking System
June 2000	FISC Co. Launched Mobil Banking system,

Table 2. Selected Country Indicators

	1995	1996	1997	1998	1999	2000
Population (unit: 1000) Year end	21,357	21,525	21,743	21,929	22,092	22,277
GDP (in NT$ billion)	7,018	7,678	8,329	8,939	9,290	9,663
GDP per capita (in US$)	12,686	13,260	13,592	12,360	13,235	14,188
Exchange Rate (against US$)						
Year end	27.265	27.491	32.638	32.216	31.395	32.992
Average	26.480	27.460	28.710	32.290	32.270	31.235

Table 3. Settlement media used by non-banks[1] (at year end)

In NT$ million

	1995	1996	1997	1998	1999	2000
Notes and coin	506,694	498,513	510,364	513,745	611,167	527,748
Transferable deposits	2,656,407	2,927,545	3,204,888	3,341,039	3,896,013	3,964,324
Narrow money supply (M1b)	3,163,101	3,426,058	3,715,252	3,854,784	4,507,180	4,492,072
Memorandum item: Broad money supply (M2)	12,805,365	13,973,876	15,094,359	16,386,722	17,745,013	18,897,797

1. The CBC issues M1a, M1b, and M2, which are defined as bellows:
   M1a = Currency in Circulation + Demand Deposits
   M1b = M1a + Passbook Saving Deposits
   M2 = M1b + Quasi-money
   Where:
   Notes and coins amounts to the currency in circulation.
   Transferable deposits amounts to demand deposits, including checking accounts and passbook deposits.
   Quasi-money consists of time & savings deposits, foreign currency deposits, postal saving deposits repurchase agreements, and non-resident N.T. deposits.

Table 4. Settlement media used by banks

In NT$ million

	1995	1996	1997	1998	1999	2000
Reserve balances held at central bank	1,272,289	1,170,483	1,203,128	1,128,950	980,539	1,009,104
Of which:						
Required reserves	1,265,102	1,161,759	1,195,943	1,122,882	968,967	1,000,034
Free reserves[2]	5,002	7,692	167	-10,415	-339	-1,849
Total reservable deposits[3]	11,195,641	12,259,478	13,145,038	13,898,370	14,872,545	15,790,283
Memorandum item:						
Institution borrowing at CBC	2,185	1,032	7,018	16,484	11,911	10,919

2. Free reserves = excess reserves – borrowing at the Central Bank of China (CBC)

2. Total reservable deposit is the base for calculating the reserve requirement.

Table 5. Institutional Framework (December, 2000)

Categories	Number of institutions	Number of branches	Number of accounts[4]	Value of accounts[5] (in NT$ million)
Central Bank	1	-	99	1,036,315
Commercial banks	48	2,411	3,296,338	316,284
Public[6]	5	462	485,692	73,840
Private	43	1,949	2,810,646	242,444
Foreign	39	70	92,462	8,251
Local Credit Institutions.	367	1,708	701,831	15,797
Development and Investment Banks:	-	-	-	-
Public	-	-	-	-
Private[7]	2	9	441	307
Foreign	-	-	-	-
Trust/Investment Co.	3	33		
Bills Finance Co.	15	47	-	-
Security Finance Co	4	4	-	-
Life Insurance Co.	32	116	-	-
Property/Casualty Insurance Co.	27	146	-	-
Money Exchangers	-	-	-	-
DBU	78	-	-	-
OBU	68	-	-	-
Post Office	1	1,305	78,362	15,397

4. Refers to checking accounts.

5. The value of accounts in central bank refers to reserve deposits plus government deposits

6. The public banks in Taiwan are Bank of Taiwan; Central Trust of China; Land Bank of China; Taiwan Cooperative Bank; The Export-import Bank of ROC.

7. The development and investment banks in Taiwan are: China Development Industrial Bank Inc. and Industrial Bank of Taiwan.

Table 6. Cash Dispensers, ATMs and EFTPOS terminals

Unit: volume in 1000; value in NT$ million

	1995	1996	1997	1998	1999	2000
CD/ATM: ATM Cards						
No. of Networks (year-end)	245	271	309	379	390	395
No. of Machines (year-end)	9,536	10,459	11,606	12,900	13,959	15,229
Volume of transactions (during)	308,061	356,021	398,265	390,334	475,666	525,610
Value of transactions (during)	3,498,559	4,044,204	4,801,748	5,186,950	5,882,658	6,729,965
Cards in circulation (year-end)	23,658	27,986	32,563	36,781	41,698	47,512
POS: Credit Cards						
No. of Networks (year-end)	2	2	2	2	2	2
No. of Machines (year-end)[8]	54,002	73,512	95,262	114,260	125,468	107,792
Volume of transactions (during)	-	-	105,407	151,164	206,444	272,281
Value of transactions (during)	190,653	272,387	374,425	491,097	597,786	719,770
Cards in circulation (year-end)	3,677	5,425	7,665	10,640	13,575	18,276
EFTPOS: Debit Cards						
No. of Networks (year-end)				9	17	18
No. of Machines (year-end)				3,598	6,207	7,323
Volume of transactions (during)				32	75	134
Value of transactions (during)				37	91	228
Cards in circulation (year-end)				3,262	7,873	12,376
Stored-value Cards: IC Card						
No. of networks (year-end)	13	15	20	20	21	22
No. of Machines (yea-end)	4,700	5,300	5,800	6,200	7,600	8,000
Volume of transactions (during)	135	55	35	124	242	343
Value of transactions (during)	397	345	33	81	156	128
Cards in circulation (year-end)	25	22	12	5	11	9

8: The numbers of machines are the contract merchants of domestic two credit card centers, the UCCC and FIS Co. ltd.

Table 7. Number of payment cards in circulation[9]

(At the end of year)

Unit: 1000

	1995	1996	1997	1998	1999	2000
Cards with a cash function	23,658	27,986	32,563	36,781	41,698	47,512
Cards with debit/credit function	3,676	5,425	7,665	10,927	18,513	25,951
Of which						
Cards with debit function	-	-	-	3,262	7,873	12,376
Cards with credit function	3,676	5,425	7,665	10,640	13,575	18,276
Memorandum item:						
IC cards	25	22	12	5	11	9

Note: *9.* Most cards are multifunctional and may appear in several categories. It is therefore not meaningful if you add the figures.

Table 8. Payment instructions handled by selected payment systems: volume of transactions

Unit: 1000

	1995	1996	1997	1998	1999	2000
TCCH						
Cheques (debit transfer)	162,230	169,115	170,950	171,958	170,228	175,019
FIS-VAN						
NIRS (credit transfer)	29,856	36,585	46,655	52,205	56,950	64,123
CD/ATM Shared System	91,980	112,260	136,560	160,490	188,360	222,590
IC Cards of which with function						
Credit Cards	867	3,099	8,023	14,536	18,257	17,885
Debit Cards				64	75	134
Stored-value Cards	135	55	35	123	358	485
On-Batch (credit/debit transfer)	1,834	2,231	2,560	2,854	3.285	4,699
FEDI			3	26	92	225
Internet Shared System					2	145
CBC-Wire						
CIFS (direct credit transfer)[10]	178	264	310	379	388	434

[10]: In general, payment order initiated by the payee side calls debit transfer, otherwise, the credit transfer, of which direct credit transfer is processed all line in one single system without cross settlement.

Table 9. Payment instructions handled by selected payment systems: value of transactions

Unit: in NT$ billion

	1995	1996	1997	1998	1999	2000
TCCH						
Checks (debit transfer)	49,328	51,183	54,957	53,492	41,489	40,835
FIS-VAN						
NIRS (credit transfer)	28,965	35,149	56,507	60,962	62,300	76,065
CD/ATM Shared System	903	1,135	1,635	2,026	2,563	3,361
IC Cards of which with function						
Credit Cards	3	12	31	53	61	57
Debit Cards				0.07	0.09	0.23
Stored-value Cards	0.40	0.34	0.03	0.08	0.16	0.13
On-Batch (credit/debit transfer)	86	89	90	108	131	148
FEDI			2	32	100	245
Internet Shared System					0.007	1
CBC-Wire						
CIFS (direct credit transfer)	64,086	96,378	112,022	129,513	118,165	134,376

Table 10. Indicator of use of various cashless payment instruments: volume of transactions

Unit: 1000

	1995[11]	1996	1997	1998	1999	2000
Checks cleared	162,230	169,115	170,950	171,958	170,228	175,019
Payments by cards						
ATM cards	308,061	356,021	398,265	390,334	475,666	525,610
Credit/Debit cards	-	-	-	-	-	-
Paperless credit transfers	30,034	36,849	46,965	52,584	57,338	64,557
FIS-NIRS	29,856	36,585	46,655	52,205	56,950	64,123
CIFS	178	264	310	379	388	435

[11]: The statistics of CIFS in 1995 covered only 8 months from May to December.

Table 11. Indicator of use of various cashless payment instruments: value of transactions

In NT$ billion

	1995*	1996	1997	1998	1999	2000
Cheques cleared	49,328	51,183	54,957	53,492	41,489	40,825
Payments by cards	3,690	4,316	5,175	5,238	6,481	7,389
ATM cards	3,499	4,044	4,801	4,747	5,883	6,730
Credt/Debit cards	191	272	374	491	598	659
Paperless credit transfer	93,051	131,526	168,529	190,474	180,464	210,441
FIS-NIRS	28,965	35,148	56,507	60,961	62,299	76,065
CIFS	64,086	96,378	112,022	129,513	118,165	134,376

* See note [11]

Table 12. Transfer instructions handled by securities settlement systems: volume of transactions

Unit: in billion shares

	1995	1996	1997	1998	1999	2000
Stocks and Equities	267.47	367.80	697.32	642.69	727.11	719.26
Of which						
TSE[12]	267.30	350.74	654.20	612.01	678.06	630.87
OTC	0.17	16.96	43.12	30.68	49.05	88.39
Bonds	-	-	-	-	-	-
Of which						
Outright	-	-	-	-	-	-
Repo	-	-	-	-	-	-
Short-term Bills	-	-	-	-	-	-
Call-loans	-	-	-	-	-	-
Foreign exchanges	-	-	-	-	-	-

[12]: TSE refers to a centralised center for the trading, clearing and settlement of listed stocks

OTC refers to a marketplace for the trading, clearing, and settlement of quasi-listed stocks.

Table 13. Transfer instructions handled by securities settlement systems: value of transactions

Unit: in NT$ billion

	1995	1996	1997	1998	1999	2000
Stocks and Equities	10,155	13,362	39,525	30,817	31,192	35,007
Of which						
TSE	10,152	12,908	37,241	29,619	29,292	30,527
OTC	3	454	2,311	1,198	1,900	4,480
Bonds	20,821	28,287	40,372	54,959	52,181	59,164
Of which						
Outright	1,772	2,622	2,571	7,108	7,212	16,651
Repo	19,049	25,665	37,801	47,851	44,969	42,513
Short-term Bills	42,064	45,031	56,741	67,924	59,656	63,915
Call-loans	13,092	12,205	11,077	14,598	9,367	9,536
Foreign Exchange[13]	4.181	4,407	4,869	4,722	4,182	4,886
Of which						
Banks-Customers	1,545	1,770	2,056	1,870	1,760	2,175
Inter-Banks	2,636	2,637	2,813	2,853	2,422	2,711

[13] : The value is daily average in US$ million.

Table14. Payment and Settlement Trends in 2000 (Daily Average)

Units: Volume in 1000; Value in NT$ billion

	1999		2000		Growth (%)		Share (2000)	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value
Cheques	170,228	41,489	175,019	40,835	2.81	-1.58	16.78	15.76
CD/ATM	475,666	5,883	525,610	6,730	10.50	14.40	50.39	2.59
Credit Card	206,444	598	272,281	720	31.89	20.40	26.10	0.28
Debit Card	75	0.09	134	0.20	78.67	122.22	0.01	0.00
IC Cards	358	0.16	485	0.13	35.47	-18.75	0.05	0.00
FIS-NIRS	56,950	62,299	64,123	76,065	12.60	22.10	6.15	29.36
FIS-On-batch	3,285	131	4,699	148	43.04	12.98	0.45	0.06
FIS-FEDI	92	100	225	245	144.56	145.00	0.02	0.09
FIS-Internet	2	0.007	145	1	7150	14185	0.01	0.00
CBC-CIFS	388	118,165	434	134,376	11.86	13.72	0.04	51.86
Total	913,488	228,665	1,043,155	259,120	14.19	13.32	100.00	100.00

Table 15 Penetration of Payment Instruments

Units: Volume in 1000; Value in NT$ billion

Retail Payment Instruments	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
Cash	507	499	510	514	611	528
Checks (debit transfer)						
Volume of Cheques Cleared	162,230	169,115	170,950	171,959	170,228	175,019
Value of Cheques Cleared	49,328	51,183	54,957	53,492	41,489	40,835
Cards						
Volume of CD/ATM	308,061	356,021	398,265	390,334	475,666	525,610
Value of CD/ATM	3,499	4,044	4,802	5,187	5,883	6,730
Volume of Credit Cards	-	-	105,407	151,164	206,444	272,281
Value of Credit Card	191	272	374	491	598	720
Volume of Debit Cards				32	75	134
Value of Debit Card				0.04	0.09	0.2
Volume of IC Cards	135	55	35	123	358	485
Value of IC Card	0.40	0.35	0.03	0.08	0.16	0.13
Credit Transfers[14]						
Volume of FIS-NIRS	29,856	36,585	46,655	52,205	56,950	64,123
Value of FIS-NIRS	28,965	35,148	56,507	60,961	62,299	76,065
Volume of On-batch Payment	1,834	2,231	2,560	2,854	3,285	4,699
Value of On-batch Payment	86	89	90	108	131	148
Volume of FEDI			3	26	92	225
Value of FEDI			2	32	100	245
Volume of Shared Internet Bank					2	145
Value of Shared Internet Bank					0.007	1
Wholesale Payment Instrument	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
Direct Credit Transfers						
Volume of CIFS transaction	178	264	310	379	388	434
Value of CIFS transaction	64,086	96,378	112,022	129,513	118,165	134,376

[14]: The data include the direct debit transfers

List of Abbreviation

TERM

ACH	Automatic Clearing House
CA	Certificate Authority
CD/ATM	Cash Dispenser/Automated Teller Machine
D/A	Delivery against Acceptance
DNS	Designated Time Netting System
D/P	Delivery against Payment
D-v-P	Delivery-verse-Payment
EFT	Electronic Funds Transfer
EDI	Electronic Data Interchange
GSM	Global System for Mobil Communications
GPRS	General Packet Radio Service
MAC	Message Authentication Code
MICR	Magnetic Ink Character Recognition
O/A	Open Accounts
PIN	Personal Identification Number
PKI	Public Key Infrastructure
POS	Point-of-Sales
RA	Registration Authority
RTGS	Real Time Gross Settlement
SET	Secure Electronic Transaction
SSL	Secure Socket Layer
SWIFT	Society for Worldwide Inter-bank Financial Telecommunication
T/T	Telegraph Transfer
	Organisation/System
CBC	Central Bank of China
CBC-Wire	Central Bank of China financial services Wire Network
CDIC	Central Deposits Insurance Company
CGSS	Central Government Securities Settlement System
CIFS	CBC Inter-bank Fund-transfer System
DBU	Refer to authorised foreign exchange banks
FISC	Financial Information Service Co. Ltd.
FIS-VAN	Financial Information Service – Value-Added Network
MOF	Ministry of Finance
NIRS	Nationwide Inter-bank Remittance System
OBU	Off-shore Banking Units
OTC	Over-the-Counter
TAICA	Taiwan Certificate Authority Company
TB-Giro	Bank of Taiwan – Giro system
TCCH	Taiwan Cheque Clearing Houses
TSCD	Taiwan Securities Central Depository Company
TSE	Taiwan Stock Exchange Co.
UWCCB-Giro	United World Chinese Commercial bank – Giro system

Chapter 11

THE PAYMENT AND SETTLEMENT SYSTEMS IN THAILAND

by

Toschanok Leelawankulsiri

1. Introduction

1.1 Overview of Thai Payment Systems[1]

As in many other countries, developed and developing, cash is still by far the dominant means of payment in Thailand. However, unlike many developed countries where hard cash is mainly used for low-value transactions, it is believed that in Thailand a significant portion of medium-value and some high-value transactions are also completed through cash payments. This is particularly true in provincial areas, or when illegal transactions are involved.

For non-cash payment, cheques are widely used for business transactions and have gained popularity over the years especially in the Bangkok metropolitan and other urban areas. In 1998, more than three quarters of cheque transactions took place in the Bangkok Metropolitan Area (BMA) alone, accounting for nearly 98 percent of the total value.

The use of electronic payment systems began with the establishment by commercial banks of the on-line computer network, which allows electronic transfer of information between bank branches, including information on payment transactions. This on-line computer network facilitates various types of payment services, such as direct credit and direct debit where transaction orders are processed simultaneously from one account to many accounts (direct credit) or from many accounts to one account (direct debit). The services are, however, limited to intra-bank payments only, where both the payer and the payee must have their accounts with the same bank.

1. From Bank of Thailand's "Payment Systems Pricing and Usage", Final Report.

Another major advance in the electronic aspect of the payment systems was the introduction of the automatic teller machines (ATMs), which greatly reduced over-the-counter workload of human tellers. Although the few separate ATM networks at the beginning were later pooled into one national ATM network, making payments using ATMs was, nevertheless, restricted to intra-bank payments, until very recently. Recently, in June 2000, six large domestic commercial banks have launched an ATM-based inter-bank transfer system called On-line Retail Fund Transfer (ORFT).

Except for the ORFT mentioned above, inter-bank payments could only be completed with cheques, drafts, cashier cheques or other paper-based means (e.g., money order, bill of exchange, promissory note). That changed when the Bank of Thailand introduced two inter-bank electronic payment systems: BAHTNET for high-value transactions and Media Clearing for off-line retail fund transfers.

BAHTNET, which commenced on May 1995, is a mean of payment designed to reduce systemic risks associated with high-value payments by using real time gross settlement (RTGS). The Bank of Thailand and members of BAHTNET have requested that certain types of transaction to be made only by means of BAHTNET. Since March 2000, almost all high-value transactions (i.e., those over 10 million baht) previously paid with cheques have been made though BAHTNET.

In January 1997, the Bank of Thailand introduced the Media Clearing, an off-line electronic means of fund transfer aimed primarily at facilitating payment transactions that take place on a regular basis, such as payrolls, dividends, interest payments, and payments of goods and services to supplier chains. It is worth noting that Media Clearing competes directly with commercial banks' in-house services of direct credit and direct debit. At present, Media Clearing is used only for direct credit.

On the other hand, the volume of BAHTNET did not show a clear upward trend. In fact, it seems to respond more to the BOT's occasional notifications requiring certain types of transactions to be carried out using BAHTNET. For example, the sharp surge of volume in March 2000 occurred when the BOT instructed the commercial banks to use BAHTNET for payments related to inter-bank lending, foreign exchange transactions, government securities trading and non-resident Baht account transactions. One can infer that BAHTNET would not be the commercial banks' first choice for high-value payments. The reason could be the high costs of fund

because the commercial banks have to maintain higher reserves, cash or bonds, with the BOT in order to comply with the BAHTNET's real time gross settlement system.

Apart from introducing new electronic payment products, the Bank of Thailand also sought to automate the process of payment with cheques. In July 1996, a central facility called the Electronic Cheque Clearing System (ECS) was established within the BOT to speed up the process of cheque transactions. With ECS, commercial banks send cheque information to the BOT's central facility, which processes the information, net settle the balances between banks, and clear the balances. Since there is no need to send the actual (paper) cheques before the settlement (they are sent later to the ECS clearing center), there is an advantage in time gain as well as the accuracy of information processing from using the electronic payment products.

Other electronic means of payment include plastic cards (credit cards, debit cards, smart cards, prepaid cards, etc.), E-money, telephone banking and Internet banking. With the rapid advancement of computer, Internet, and telecommunication technology, these payment services will certainly gain wider use.

1.2 Common Methods of Making Payments and Settlements

The majority of the general population in Thailand still prefers to carry cash for making daily payments. Should the transaction value exceed the amount of cash a person normally carries, one could obtain cash from a nearby Automated Teller Machine (ATM), or use a credit card, provided the retailer is wired for credit card transactions.

On the other hand, the commercial and financial circle has a preference for cheque as the payment medium, as it has a comprehensive legal backing for payment and debt settlement purposes. That is, the cheque bearer can take legal action against the payer in the event that the cheque cannot be honoured due to insufficient funds. Moreover, the Bank of Thailand (BOT) also issues BOT cheques to financial institutions and government agencies that maintain deposits with BOT for payment purposes.

Thai payment and settlement system has gradually developed over time. The pace of development is especially advanced in the metropolitans with

the requisite infrastructure such as modern communication and transportation, the urban affluence, and the sheer number of service users that warrant the investments in the systems and equipment. These include, for instance, ATM machines, credit card services, or Electronic Funds Transfer at Point-of-Sale (EFTPOS). Thai commercial banks first introduced the cash- service ATM to the public in 1983. The ATM service became very popular mainly because ATM service is compatible with the societal preference for cash. Subsequently, commercial banks made their individual ATM network inter-connected with one another, so that ATM service became more widely available and useful to the general public.

Besides cash-related developments, other aspects of payment system development include credit cards, debit cards, smart cards, direct credit, direct debit, and electronic banking services such as tele-banking and office-banking. These have become popular particularly among urban population with steady incomes.

Payment systems for financial institutions have also evolved with the development of the retail sector. For instance, there is the BAHTNET system, an electronic funds transfer system whereby an institution can effect high-value transfer from its account at BOT to another BOT account on a Real Time Gross Settlement (RTGS) basis, transacting either on its own behalf or on the behalf of a client. As for interbank clearing, BOT operates the Electronic Clearing House (ECH) to provide net balance calculation and settlement services for handling interbank cheque clearing and retail funds transfer (Media Clearing). The ATM and interbank credit card clearing and settlement, however, are operated by the private sector.

In addition, there are other payment service providers, for instance, the Communication Authority of Thailand, which provides postal order and postal money order, a popular medium due to its wide area of service coverage. There are also the Counter Service Co. Ltd. and the Telecommunication Co. Ltd., which provide utility bill payment services.

1.3 Institutions that Provide the Payment and Settlement Services

Payment service providers play different roles according to the type of institutions. They are as follows:

1.3.1 Commercial Banks

Commercial banks throughout the country provide paper-based media, such as cheques and drafts, as well as non-paper-based media, such as EFT and ATM, to individuals and legal entities in general.

1.3.2 Specialised Banks

Specialised banks, i.e., The Government Savings Bank (GSB), The Government Housing Bank (GHB), Bank for Agriculture And Agricultural Cooperatives (BAAC), and the Export-Import Bank of Thailand (EXIM) can issue cheques to their clients and provide funds transfer services to the general public.

1.3.3 Communication Authority of Thailand

Communication Authority of Thailand (CAT) provides payment services such as postal and money orders. Some are cash exchangeable at any post office location. Others require the payee to exchange for cash at specified locations. They can be sent both domestically and abroad via normal post, EMS, or telegraph. In addition, CAT has extended its payment services to include the payment of utility bills, i.e., electricity, water, and telephone bills, as well as the payment of annual car taxes and traffic violation penalties, and funds transfer services with a number of commercial banks, etc.

The main advantage of using postal payment services is that they provide convenient methods of payment and funds transfer to the general public, particularly those in the rural areas, as there are post offices in most districts and sub-districts. However, at present post offices do not provide electronic funds transfer services.

It should be noted that, unlike commercial banks and other payment service providers, CAT is not under BOT supervision, but operates under the Postage Act of 1934 and the Ministry of Transportation's Ministerial Regulation.

1.3.4 Card-issuing Institutions

Card issuers in Thailand consist of commercial banks and prominent credit card companies, i.e., VISA, MasterCard, Diners, and American Ex-

press. In addition to making payments, these cards allow the cardholders to withdraw cash from ATMs. Meanwhile, reloadable cash cards are still in the initial stage of gaining acceptance, there being a limited number of stores that accept its use for transactions. Microcash is one example of such a cash card.

1.3.5 Bank of Thailand (BOT)

The Bank of Thailand Act of 1942 has stated three main responsibilities of the BOT as follows:

(1) To exercise the authority to issue, manage, and print notes and bank notes.
(2) To act as the banker for the government and financial institutions, whence administering an interbank clearing system.
(3) To act as an agent of the government in carrying out any entrusted responsibilities.

1.3.6 Other Institutions

1.3.6.1 Thai Bankers' Association

Thai Bankers' Association is a collaboration of commercial banks registered in Thailand. The association's involvement with the Thai payment system concerns carrying out the BOT policy with regards to developing the ORFT system, which responds to the public need for small-value interbank funds transfer services.

To ensure that funds transfer transactions and various forms of payments between banks proceed smoothly, a number of institutional "Clubs" have been established with the auspicious association to seek coordination and cooperation in providing payment services. These include, for example, the Payment System Club, the Banking IT Club, the Credit Card Club, the Branch-Operation Manager Club, and the Provincial Bank Club, etc. Furthermore, the Thai Bankers' Association assumes an important role as the representative of Thai banks, adviser to BOT and other government agencies on the development of, and the issuance of regulations concerning various payments and settlement system and their innovations in order to ensure fairness to all parties concerned.

1.3.6.2 The Foreign Banks' Association

The Foreign Banks' Association is a collaboration of foreign commercial banks' branches, Bangkok IBF (BIBF), and representative offices. Its purpose is to work jointly with BOT and the Thai Bankers' Association on matters relating to banking business and services.

1.3.6.3 The Thailand Securities Depository Co. Ltd.

The Thailand Securities Depository Co. Ltd. was established and owned by the Stock Exchange of Thailand as the settlement and deposit centre for Thai securities. It provides securities payment, delivery, deposit, and registry services to its members.

1.3.6.4 The Processing Center Co. Ltd. (PCC)

The Processing Center Co. Ltd. (PCC) was established with the investment by a number of Thai commercial banks and private companies to function as a back-up computer centre for stockholders and to provide cheque-sorting services for a number of Thai commercial banks. Subsequently, when Thai commercial banks reached the BOT-initiated agreement to combine ATM networks into a common ATM pool, PCC's role then shifted into that of a Switching Center, processing information and calculating fees incurred between banks. Moreover, when the Thai Bankers' Association introduced the plan to develop the On-line Retail Funds Transfer (ORFT) system, PCC was entrusted with developing the system of existing ATM network.

1.4 Legal Framework

Among the institutions that provide payment services in Thailand, the principal remains the Bank of Thailand, established under the Bank of Thailand Act of 1942 and operating under the Royal Decree Regulating the Affairs of the Bank of Thailand of 1942. As per the Royal Decree, BOT operations which concern the payment system include issuing, managing, and printing notes and bank notes, managing the country's reserves, and operating the interbank clearing system. Second in importance are the Thai commercial banks and the local branches of foreign banks, which operate in accordance with the Commercial Banking Act of 1962 and are under the direct supervision of the BOT.

Currency operations such as the issuance of notes are carried out according to the Currency Act of 1958. Other financial papers used as a means of payment such as cheques, bills of exchange, and promissory notes are under the Civil and Commercial Code.

Funds transfer in paper-based form falls under the Civil and Commercial Code. There is no law specifically legislated to govern funds transfer through electronic means. As such, it is up to the service-providing banks to set the guidelines and conditions of use with their clients. Moreover, these guidelines have not been standardised; any dispute that may arise would have to be settled by the Civil and Commercial Code.

1.4.1. BOT Regulations Pertaining to the Payment System

In its capacity as the provider of electronic interbank cheque clearing, large-value funds transfer (through BAHTNET), retail funds transfer (through Media Clearing), and provincial cheque clearing and collection services, BOT has issued regulations and guidelines specifying the rights and responsibilities, as well as the conditions of use between the service provider and the members using the system. They are as follows:

(i) The Bank of Thailand Regulation on BAHTNET 1995
(ii) The Bank of Thailand Regulation on ECS 1996
(iii) The Bank of Thailand Regulation on Media Clearing 1997
(iv) The Bank of Thailand Regulation on Interbank Settlement for Clearing Houses Operating Outside Bangkok 1996 and as amended in 1997
(v) The Bank of Thailand Regulation on Interbank Settlement for Provincial Cheque Clearing in Bangkok 1997
(vi) The Bank of Thailand Regulation on Reporting the Net Clearing Position of Interbank Provincial Cheque Collection in Bangkok 1999

1.4.2. Guidelines for Providing Electronic Funds Transfer Services

In its supervisory capacity over the payment system, BOT anticipates that the lack of specific law pertaining to electronic funds transfer may lead to an unfair treatment of customers. Therefore, with the principal concern over consumer protection, BOT introduced the operating guidelines for commercial banks with regards to electronic funds transfer services. These are as follows:

(i) Commercial Bank's Guideline on Electronic Funds Transfer, July 5, 1994
(ii) BAHTNET Funds Transfer Guideline for Commercial Bank's Customer Service, April 5, 1999
(iii) Media Clearing Guideline for Commercial Bank's Customer Service, January 16, 1997

1.4.3. Revising the Legal Codes Concerning the Payment System

The lack of specific law pertaining specifically to the payment system means that payment transactions fall under the Civil and Commercial Code. However, BOT and other government agencies concerned are well aware of the rapid pace of development in computer and information technology, and hence the need to ensure that the legal framework stands ready to cope with such a rapid technological development. The Ministry of Justice and responsible agencies are in the process of revising the Civil Procedure Code in order to support the admissibility of electronic data as evidence in court. Moreover, official bodies have undertaken to draft altogether six information technology laws, as follows:

(i) Data Protection Law
(ii) Computer Related Crime Law
(iii) Electronic Transactions Law
(iv) Electronic Signature Law
(v) Electronic Funds Transfer Law
(vi) Universal Access Law

2. Existing Payment and Settlement Systems

2.1 Domestic Payments

2.1.1 General Overview

The most popular payment medium is cash. This is due to a variety of reasons. It is convenient to carry cash around for transactions; it is immediately accepted everywhere as a legal tender; cash is suitable for small-valued goods and services transactions in a country with a relatively low-income population; and in many parts of the remote area, there is no suitable substitute for cash. Other payment media, i.e., cheques, drafts, bills of exchange and promissory notes, were brought into use with the expansion of the economy and the development of the commercial banking sys-

tem. The evolution of the commercial banks' roles as financial intermediaries for such financial services as deposit taking and funds transfer has made it convenient to deliver, transfer, and store cash. Subsequently, and with the development of computer and communication technology, various banks began offering electronic services to customers. These include making cash deposits and withdrawals from different branches, cash deposits and withdrawals via ATM, and a number of plastic-card services, including credit card and debit card services.

2.1.2 Payment Methods

2.1.2.1 Cash Payment

Cash consists of notes and coins. Notes account for 96 percent of the total cash in circulation, with coins minted and distributed by the Ministry of Finance making up the rest. Since cash is a basic means of payment, it is used as an index to measure the people's purchasing power through the money supply (M1), which includes cash and current account deposits, held at commercial banks.

During 1993-1997, cash accounted for 73 percent of (M1) at end of period average.

Cash-related management operations, most of which involve notes, entailed a complicated and expensive process, from note printing, storage, transportation, amount verification, sorting out damaged notes to be destroyed, and the security measures necessary in carrying out all these operations. With the economic expansion came the needs for higher volume of cash in circulation and the concomitant increase in cash-related costs. The business sector would also have to deal with increased economic burden, which could end up hampering business operations. Advanced economies have therefore developed non-cash payment alternatives, with hopes that such media would better facilitate business transactions and trades of goods and services.

2.1.2.2 Non-cash Payment

At the end of 1997, deposit accounts with commercial banks numbered around 48 million, which translated into Baht 3.9 trillion or 83 percent of GNP. These deposit accounts form the basis from which customers can avail themselves of account-related, non-cash payment facilities. These in-

clude paper-based payment of cheques, drafts, and paperless payment such as prepaid debit transfers, credit and ATM cards, and electronic funds transfer, etc.

a. Paper-based Payments

i. Payment Order

It is a form of payment in which the customer orders the bank to transfer funds from one's account to a beneficiary or to another bank account via telegraph, post, wireless, and telephone.

ii. Cheque

It is a means of payment in which the payer orders the bank to debit their current account and credit the payee's account unconditionally. It is one of the most common forms of payments due to its convenience, unlimited order amount, and widely accepted in business circle.

iii. Bill of Exchange

It is a means of payment in which the payer orders a third party to act on one's behalf to pay the payee. It will be issued under designated conditions and time period, which may be pre-determined or may totally depend on the payee.

iv. Promissory Note

It is a means of payment in which the issuer promises to pay a certain amount to the beneficiary when the amount is due, i.e., at maturity.

b. Paperless Payment / EFT

As the application of computer and communication technology became commonplace in the banking and financial sectors, paper-based payments correspondingly evolved into electronic forms. These include EFT, ATM, EFTPOS, and international electronic funds transfer systems such as S.W.I.F.T. Presently, paperless payment media in Thailand comprise of the followings:

i. Preauthorised Credit / Debit Transfer

Preauthorised credit/debit transfer was introduced by the commercial banks in 1987, which began with the transferring of salaries from the employer's account to the employees' accounts held at the same bank, a method also commonly known as a direct credit service. Apart from this, a direct debit service was introduced for transactions that occur on a recurring basis, namely utility bills and credit card payments. Note that these types of services entailed funds transfers executed internally within the same bank. It was not possible at that time to provide such services across different banks.

Since January 1997, BOT has introduced Media Clearing as a retail funds transfer service for direct crediting and direct debiting across different banks.

ii. Plastic Cards

Plastic cards were developed in response to the consumers' desire to reduce cash holding and the desire for greater flexibility and convenience. Plastic cards are classified into 2 types according to physical characteristics: magnetic cards and smart cards.

Magnetic cards, which have been around for quite some time, use magnetic stripe to store information, while smart cards utilise microchip technology for data storage, whence overcoming the security weaknesses of the magnetic medium. Smart cards are designed to prevent tampering and falsification with stored information. For interoperability reasons, smart cards usually appear in the same size as credit cards. The electronic circuits, which are embedded in front or at the back of the cards, can store and evaluate the information on an off-line basis.

With the tremendous amount of information that can be stored, it is envisioned that smart cards could well replace a wallet full of cash, credit/debit cards, ID cards, and health information tags in the future. However, the significant amount of capital outlay necessary for initial start-up limited the use of smart card. Smart cards also suffer from a lack of standardisation and the infrastructure necessary to guarantee interoperability among cards originated from different sources.

Plastic cards can also be categorised according to the payment arrangements, such as whether the payers "pay later", "pay now", or "pay before" the transactions.

Credit Cards

Credit cards imply a "pay later" type of payment. The issuer determines the cardholders' profiles and decides on the appropriate credit limits. A cardholder uses the credit card to buy goods or services, but will be exempted from making payment for a hitherto agreed-upon period of time, commonly known as a grace period. In any event, the issuer first pays for the goods or services that the cardholder buys. Later on, the monthly statement will be sent to the cardholder, showing the net balance and the due date by which the cardholder would have to submit payment. However, the issuer may give the cardholder an option to schedule deferred payments at an interest subject to the issuer's condition. Minimum rate for deferred payments stipulated by the BOT is a payment of 10 percent of the amount due or a minimum payment of Baht 2,000.

Credit cards with no deferred payment contract are commonly known as charge cards. Often, the issuer is not a financial institution and therefore is unable to grant credit to its customers. The customers are required to pay the bill sent to them in full. Charge cards like American Express and Diners Club cards are generally used for paying for leisure activities, such as travels and entertainment. Another type of charge card that is commonly used is the retailer card. It is usually issued, for marketing reasons by the department stores to encourage the customers to shop at their particular stores. These include, for example, Central department store and Robinson department store cards.

Credit cards issued by commercial banks grew rapidly in popularity among consumers in Thailand. By the end of 1997, there were 1.5 million credit cards in Thailand, as compared with 1.4 millions in 1993. The value of transactions totaled Baht 150,000 million, or about Baht 12,500 million per month on an average. However, the uses of credit cards abroad in 1997 amounted to Baht 11,000 million, a year-on-year decrease by about 22 percent from the end of 1996. This may reflect the economic factors and changes in the consumption pattern, as more Thai people tend to travel and buy goods domestically.

Debit cards / ATM cards

Debit cards imply a "pay now" type of payment, to be used in conjunction with the cardholders' saving or current accounts. Generally, the issuer would develop its ATM cards into debit cards. Examples include those issued by the Bangkok Bank, the Thai Farmer's Bank, and the Siam Commercial Bank. Examples of international debit cards include Maestro and Visa Electron Cards.

Debit card is appropriate for those who prefer not to carry around large sums of money and want to pay for goods and services out of their own accounts. The advantages for both the cardholders and the business owners are as follows:

- Not having to carry large sums of money means less risk of loss.
- No need to make stops at banks or ATMs for cash. Better and more effective cash management stemmed from the fact that the issuing bank will debit the account only on the amount tendered. The balance still earns an interest.
- The business owner can reduce both the expense and time for cash handling since the funds will be automatically transferred to them. No risk of theft and burglary for businesses, particularly those that operate 24 hours a day, such as gasoline station and convenience stores, etc. The ATM customer base is very large. Aside from the convenience offered, card issuers need not screen the cardholders, who must maintain positive balances in their accounts before direct debiting is possible, unlike commercial bank-issued credit cards, which necessitate credit screening. By December of 2000, there were some 20.7 million ATM cards, or eleven times the amount of credit issued. The widespread acceptance of the debit card system, along with the commercial banks' efforts to develop their ATM cards into debit cards and to increase the number of EFTPOS service points, should see a significant reduction in the amount of cash usage.

Prepaid Cards

Prepaid cards imply a "pay before" type of payment. Here the cardholder pays the issuer in advance of transactions. These are designed to expedite the transactions for low-value goods or services such as the use of public telephone, car parking, expressway, or public bus fares, items normally paid with coins. This saves both the buyers and sellers the burden of making sure they have enough coins of appropriate denominations, count-

ing and storing the physical coins. These inconveniences can all be overcome with prepaid cards.

The most commonly used prepaid cards in Thailand are the telephone cards, issued by the Telephone Organisation of Thailand. Telephone cards have also gained rapid popularity as "collectors' items", not unlike collectible stamps. Other prepaid cards are issued for cinema tickets and public bus fares, but their usage is still comparatively limited.

iii Other Electronic Banking Services

Apart from the aforementioned EFT services, commercial banks also provide electronic banking services whereby each bank has its own term such as office-banking, home-banking, or tele-banking. It is an electronic service in which the customers can instantly access their account balance information and other information on-line using a telephone or a personal computer (PC), connecting to the bank's electronic network. The customer receives a password which will be used as a key to get into the bank's computer system and to perform such transactions as account balance inquiry, requesting a letter of credit, funds transfer and other types of payment. In addition, many commercial banks have developed their network to allow corporate customers to perform large-value and import/exported-related transactions over the bank's network via the Internet.

iv. BAHTNET Funds Transfer

BAHTNET is a large-value funds transfer system linking its users to the BOT current account system. It is a service designed for commercial banks and financial institutions with BOT accounts as well as for the general public who would use the service to transfer funds from one's account to the beneficiary at another bank.

2.1.3 Structure, Operation and Administration

Interbank payments can be classified into two types according to the nature of transactions that prompt interbank settlement: payment transactions for bank customers and payment transactions resulting from the banks' own businesses.

Customer transactions that result in subsequent interbank collection, payment and settlement include, for example, depositing cheques issued by

a different bank, withdrawing cash from another bank's ATM, and paying with a credit card issued by another bank, etc.

Banks' own business operations also involve financial transactions that require interbank collection, payment and settlement. These include, interbank borrowing and lending, foreign exchange, trading, securities investment, as well as transactions on behalf of foreign residents involving payment instruments such as cheques, draft, cashier cheques, or BOT cheques.

Interbank payments are processed through a settlement centre at the central bank or one operated by a commercial bank. In any event, the member banks must have accounts with the settlement bank, so that the banks with net debit position will have their accounts debited, while those with net credit position will have their accounts credited.

Such a method of interbank payment is a form of net settlement, whereby all interbank transactions are first netted, and payment is made once the calculation is completed and only on the net amount owed between banks. There is another method of interbank payment which is a form of gross settlement, namely the BAHTNET system, whereby each transaction simultaneously effects an account debit for the payer bank and an account credit for the payee bank on an item-by-item basis, hence the funds transfer is completed immediately.

Important interbank payment systems and settlement processes are as follows:

2.1.3.1 Interbank Electronic Cheque Clearing System (ECS)

a. Background

Until recently, interbank cheque clearing in Bangkok and the metropolitan area was a fully manual paper-based operation, with the member banks sorting the cheques by paying banks, calculating balances, and clearing among themselves. The method was subject to errors and there were delays in the clearing process affecting the financial market operations. Moreover, the increased daily cheque volume commensurate with economic growth and the worsening of Bangkok traffic commensurate with urban growth imply that banks have to move up the cut-off time for depositing cheques for same-day collection, resulting in more and more bank customers missing

the cut-off time. Cheques that were deposited late would be held back for processing on the next day, with customers only able to withdraw against the cheques on the day after. These problems associated with manual operations were addressed by BOT with the introduction of the Electronic Cheque Clearing System (ECS). ECS relies on the electronic data read off the cheques, rather than on the physical cheques themselves, for purposes of calculating net clearing positions and customer account posting. This pertains to both normal and return rounds of collection, making Thailand the first country to operate on-line data transmission for both rounds.

The Electronic Clearing House (ECH) was established by BOT to operate the ECS and act as a centre for exchanging cheques between member banks, and also to set regulations concerning interbank electronic cheque clearing. ECH became operational on July 16, 1996.

b. Regulations, Guidelines, and Policies

Section 12 (16) of the Royal Decree Regulating the Affairs of the Bank of Thailand (1942) stipulates that operating an interbank clearing system constitutes a central banking responsibility, to be undertaken by BOT. As such, the Regulation of the Bank of Thailand Re: The Interbank Electronic Clearing in Bangkok (1996) was issued to ensure smooth ECS operations among member banks. This regulation specifies roles and responsibilities of member banks, operational procedures and other related operations. The regulation also stipulates that any problem relating to the interpretation of the rules should be resolved by BOT. Moreover, should a dispute arise concerning interbank clearing, as per the regulation, an arbitration panel appointed by member banks and by BOT would constitute the final arbiter.

c. Participants in the ECS

ECS members must legally constitute a commercial bank under the commercial banking law or a specialised bank established under a specific law. As of December 31, 2000, there were, including BOT, 38 ECS member banks, covering all member bank branches in Bangkok, Nonthaburi, Pathumthani, and Samutprakarn, as well as a number of branches in Samutsakorn, Ayutthaya, and Nakornprathom, totalling some 1,812 bank branches. However, BOT plans to expand the scope of ECS operation to include other provinces in the near future.

The ECS system can handle both on-line and off-line ECS member banks. On-line members send cheque data to ECH via computer and communication networks; whereas, off-line members deliver physical cheques to ECH, who then read the cheque data and input the information into system on their behalf. At present, all ECS members are on-line members.

d. Types of Payment Instruments Handled through ECH

Payment instruments that are processed through ECS include cheques, drafts, bills of exchange, and promissory notes denominated in Thai Baht. However, these instruments must be issued by ECH member banks or have their payments guaranteed by ECH member banks.

e. Operational Procedures

i. Normal Round Clearing

With ECS, customers can deposit their cheques at member banks almost any time during the banking hours. Each member bank determines its own cut-off time (approximately between 1:00 p.m. and 2:00 p.m.) within which cheque depositing customers will have their accounts credited and cheques sent for collection on the same day, and can withdraw against the deposits on the next business day.

Once on-line member banks received the cheques from their customers, they will read and transmit the cheque data on the code line, encoded with Magnetic Ink Character Recognition (MICR) printing, to ECH electronically within the time limit. On the other hand, off-line member banks would have to send physical cheques to ECH for data capture. Both sources of cheque data will be combined to determine the preliminary net clearing positions, with the generated report or on-line data sent to member banks.

After that, ECS will extract and send information on high-value cheques (with amount from Baht 10 million upward) to member banks, which will then verify and possibly reject these cheques. Information on rejected high-value cheques will be removed from the new net clearing positions, while information on those not rejected will be used by paying bank to debit the paying customer accounts. The net clearing balances will be settled through the BAHTNET system. In the evening of the same day, on-line member banks must send the physical cheques to ECH for reading, sorting, and veri-

fying against the electronic information received during the day. The physical cheques are sorted by paying banks, bank branches, and account numbers, and used for verification purposes by the paying banks. Cheques sorted by banks or branches and accounts will be ready for pick up early the next morning.

ii. Return Round Clearing

On the morning of the next business day, member banks would send information on returned cheques, including reasons explaining why the cheques were returned, on-line or off-line to ECH for return-round net clearing position calculation and settlement via the BAHTNET system. The information on cheques not returned would be sent to the receiving banks, which, in turn, would release hold on their paid customers' accounts. The returned cheques are physically delivered to ECH, who would have them distributed to the sending banks later on.

f. Processing and Equipment

ECS relies on cheque data sent by member banks to ECH, which must have the necessary equipment and computers to read, receive, send, and process the data.

Each on-line member bank is required to have a reader/encoder in order to be able to read the data printed on the code line of each cheque as well as encode the cash amount on each cheque with MICR ink type E-13B. These encoded cheques are then sent to ECH in the evening. Each member bank must have a centralised information that processes information from its branches and sends it to ECH electronically via an Electronic Clearing House Front End Processor (ECHFEP).

ECH uses a router, connected to member banks' ECHFEP machines, and a host machine, which processes cheque data, sent by member banks to ECH and controls the operations of 6 reader/sorter machines. Each reader/sorter can read data stored in the code line at a rate of 1,700 cheques per minute, sorting them according to bank branches and account numbers. The data read is verified against the information sent electronically by on-line member banks.

g. Settlement Procedures

ECS calculates net clearing positions and prepares the electronic data for settlement via BAHTNET, using its multilateral funds transfer function. The member banks' accounts at BOT will be debited/credited according to their net clearing positions. Credited banks will not be able to use the transferred funds for further transactions until after the return round of settlement on the next day.

Member banks can begin to accurately manage their funds as soon as they received the net clearing positions (by about 3:45 p.m.). If a debited bank find that its BOT account balance to be insufficient for meeting settlement, then it could begin borrowing from other banks or from the money market. If the required amount could not be deposited in the debited bank's BOT account within the time limit, i.e. by 5:00 p.m., then that round of settlement will be deemed void. A new net clearing position calculation will be made, but with all items transacting with that particular bank excluded from the new calculation. The settlement will proceed as normal with respect to the remaining banks. The same settlement failure rule applies to the return round, except that the normal round settlement will be re-calculated as well.

h. Pricing Policy

ECH is a non-profit operation. For ECS settlement and cheque sorting by banks, the sending banks are charged Baht 0.20 per cheque, while the paying banks are charged Baht 0.40 per cheque. For sorting by bank branches and account numbers, the paying bank would be charged Baht 0.60 per cheque. Moreover, in order to account for the quality of incoming cheques, ECH would charge Baht 5 for repairing each faulty cheque should the number of cheques rejected by the reader/sorter machines exceed 3 percent of the cheque volume.

At the same time, commercial banks charge their current account customers Baht 2 per cheque, and the customers are subject to a further Baht 3 per cheque for a stamp duty. BOT supervises the setting of fees charged to bank customers to ensure that the overall fee structure is appropriate.

i. Security and Risk Management

For data security measures, the system employs secret codes in the data transmission. The Message Authentication Code (MAC) calculated from the incoming data for each item will be sent together with each data transmission to a paying bank. The paying bank debits its client account and prepares the return cheque data, which is sent back to ECH the next day. The system has to determine that the MAC value on the incoming message is identical to the one sent out by ECH. Moreover, should a member bank be unable to send information on-line, and has to rely on recording media, the system also provides secret codes for such a situation as well.

Because cheque information received electronically is used to calculate net clearing positions, the system minimises operational risk from data transmission by separating out high-value cheques that can significantly affect the net clearing positions, and allowing the paying banks to examine and possibly reject these high-value cheques by 4:00 p.m., before the daily settlement commences around 5:00 p.m. Finally, there are operational procedures and contingency plans that have been set up to handle emergency situations that may prohibit normal settlement procedures.

j. Contingency Plans

BOT has set up a backup ECH site at the BOT head office (Bangkhunprom) to handle any emergency situation that would prevent ECH from operating. The backup ECH can operate the entire cheque clearing process, from receiving and sending cheque data, to reading and sorting cheques with its 4-reader/sorter machines.

In addition, BOT has outlined operational procedures for handling varying degrees of emergency that would affect member banks or ECH itself. For example, should a member bank be unable to send cheque information to ECH via a leased line, a dial-up line is to be used, should an on-line operation fail, recording media can be used, and should a member bank be unable to prepare cheque data, the physical cheques can be delivered to ECH for processing.

2.1.3.2 Provincial Cheque Clearing

a. Background

In order to speed up and improve the efficiency of provincial cheque clearing, to reduce the cost and risk associated with cheque payments, and to facilitate cash management for member banks, BOT set out to improve the provincial cheque clearing system in the following ways:

i. Upgrading the provincial clearing houses to reduce the 3-7 days required to clear a cheque to a one-day clearing process. This entails expanding the clearing centre coverage to include various districts within the province and some districts from a neighbouring province. Originally the system only handles the civil district. Moreover, operational efficiency is improved through the introduction of computer systems and various improvements in the interbank settlement process. Whereas originally BOT representatives at the provincial treasuries performed interbank settlements, now these operations are centralised through the BAHTNET system. BOT, in conjunction with the member banks, first upgraded the cheque-clearing centre at Phuket on September 15, 1997, and has since expanded the programme to other provinces, with the target of covering all 71 provinces.

ii. Improvement of the provincial bill for collection (B/C) procedures (for clearing originating from different provincial clearing house domains) in order to reduce the 7-15 days previously required to within 6 working days. In the initial phase, BOT has issued a BOT regulation requiring the member banks to report B/C results to customers within the time limit. Subsequently, BOT intends to reduce the time limit.

The collecting bank has two alternatives of sending B/C for funds collection.

First method: The collecting bank sends cheques to its branch that is located within the area covered by the same clearing house as the paying bank. The cheques then enter one-day clearing process, as per (1). Once the B/C results are known, the agent branch then notifies the original branch for collection.

Second method: Generally used when the collecting bank does not have a branch located within the area covered by the same clearing center as

the paying bank, here the collecting bank sends the cheques through the paying bank's headquarter via ECH, which calculates the net clearing positions for the member banks. The paying bank notifies its counter party, the collecting bank, of the B/C results, and record the information for ECH, who then carries out interbank settlement via BAHTNET.

Both methods, according to an agreement reached among member banks, should take no more than 15 working days. With the introduction of the new BOT regulation introduced, both methods will take no more than 6 working days. As for the development to improve system efficiency and to achieve one-day clearing, this depends on the member banks' readiness with regards to acquiring the on-line signature authentication technology necessary in order that bank branches throughout the country would be able to authorise cheques on-line. BOT is in the process of establishing working plans that are appropriate for the new technologies.

b. Regulations, Guidelines, and Policies

- Upgrading of provincial cheque-clearing houses is done according to the following regulations, guidelines and operating standards:

(i) Expanding the cheque-clearing coverage to include all districts in the province and some districts of nearby provinces. The domains are decided according to the economic relationship, the cheque-clearing traffics, and the viability of actual delivery of cheques to the clearing house for one-day clearing.
(ii) The system is based on one-day clearing, meaning that the exchange of physical cheques, interbank settlement and customer account crediting take place within the same working day, and that customers can withdraw cash on the next working day.
(iii) The nomination of a major bank branch as the representative for clearing.
(iv) Net clearing positions are sent to BOT headquarters for settlement on a daily basis.
(v) Computer systems are used to expedite the recording of cheque data and the calculation of net clearing positions.
(vi) For branches in the outskirts or remote districts, facsimiles of returned cheques can be exchanged for the return round, and the process considered completed once the physical cheques are later returned in the next normal round of clearing.

(vii) Physical cheque delivery services are shared in order to save operating costs.

With regards to the cheque clearing operations of the provincial clearing houses, member banks of each province has a joint set of operating guidelines, roles and responsibilities of each member bank, an agreement which is signed and abided by all member banks. Regulations that were enforced in all provinces are generally standard, differing only in some details, such as on matters of penalty charges, etc.

As for centralised interbank settlement of provincial clearing houses, there is the BOT Regulation on Interbank Settlement for Clearing Houses Operating Outside Bangkok 1996, as amended in 1997, which specifies the authority, roles and responsibilities for BOT in its capacity as the settlement service provider to member banks. The regulation also stipulates that member banks abide with BOT notification concerning guidelines, procedures, and timeframes involved in interbank settlement, issued as per the regulation on settlement.

- Concerning B/C, since 1981, Thai Bankers' Association was the one who specified B/C regulations and procedure, limiting B/C collection time within 15 days. When 6-day B/C collection is made possible, BOT issued the regulation requiring member banks to notify B/C results to customers within 6 days. This applies to both types of B/C collections.

With regards to interbank settlement for B/C operations, BOT issued the Bank of Thailand regulation on Settlement of Inter-Provincial Cheque Clearing 1997. This specifies the authority, roles and responsibilities for BOT in its capacity as the settlement service provider to member banks, and spells out the member bank practices with regards to preparing B/C data of successfully collecting B/C, for purposes of settlement within the specified timeframe.

c. Participants in the System

Members of a provincial cheque-clearing house consist of the BOT and commercial banks operating under the commercial banking law as well as specialised banks established under specific laws. There were 17 member banks, including BOT, as of December 31, 1999. Once the upgrading of provincial clearing houses is completed, there would be over 3,000 branches

belonging to provincial clearing houses, with a particular branch being able to join more than one clearing house.

d. Operational Procedures

i. Normal Round Clearing

When a member bank branch receives cheques deposited by customers, individual cheque information is entered into the system. The physical cheques will be sorted by bank, and sent to the main branch for compiling. The main branch sends the physical cheques together with the media containing cheque information to the clearing house by 1:30 p.m. The clearing house then prepares net clearing positions report for each bank branch. The in-clearing data is stored on media and is distributed to member banks together with a report. The net clearing positions combined with those from the return round will be sent to BOT via file transfer for settlement via BAHTNET within the same working day.

ii. Return Round Clearing

On the next working day, the paying bank will sort out returned cheques and enter the cheque information, together with the reasons for returning, to the system. For remote branches, facsimiles are used in place of sending in physical cheques. The main branch compiles the returned cheque information and delivers the returned cheques or facsimiles thereof, to the clearing house by 9:00 a.m. The clearing house then prepares net clearing position report for each bank branch. The information of the returned cheques is stored on media and distributed to banks together with a report. From there, the net clearing positions will await those from the normal round for combined settlement on the same day.

e. Processing Equipment

The necessary processing equipment includes:

i. Clearing House Side

Microcomputers with printers, fax modem, facsimile machines, backup power system (UPS), and telephone lines.

ii. Member Bank Side

Microcomputers with printers.

f. Settlement Procedures

For each upgraded provincial as well as district clearing house, BOT has developed the cheque settlement operations into a standardised, centralised system, one which enables more effective cash management by the member banks. By 3:00 p.m., clearing houses throughout the country will send net clearing position information via file transfer to ECH, using encryption for data security.

At the ECH, the information will be decrypted and calculated for a net clearing position of each member bank. BOT regional branch will confirm the net clearing position with each member bank in the region. ECH will notify member bank headquarters of their net clearing positions within 4:00 p.m., and carry out settlement through BAHTNET by 4:30 p.m. Member banks with positive settlement balance can immediately use the funds.

g. Pricing Policy

In order to reduce settlement risk in provincial cheque clearing, BOT encourages the use of a centralised settlement system. BOT charges a bank at a non-profit seeking fee of Baht 1,000 per bank branch per year.

h. Contingency Plans

BOT has drawn up contingency plans as follows:

i. Each clearing house must procure computer, telecommunication, and electrical backup systems, and staff must be trained to replace one another and to operate the manual system. Moreover, there must be protection measures against computer virus. In the same vein, member banks are also required to secure backup machines at the main branches, which must be able to handle equipment failures at the main branches as well as at the smaller branches.

ii. Contingency plans must be developed for each clearing house and member bank. For example, should a member bank be unable to deliver the cheque data to the clearing house, whether due to recording

failure at the main or at any other branches, the main branch will report the aggregate of net clearing positions of each bank to the clearing house. Manual operations will be used in case the normal process fails to function.

iii. In the event that a clearing house cannot send net clearing positions to BOT via file transfer, facsimile will be used. Should the facsimile failed, other means of communication, such as mobile telephones, radio communications will be utilised, or if no other means is available, settlement will be postponed to the next day.

2.1.3.3 Media Clearing

a. Background

In the past, each commercial bank provided funds transfer services to its clients, but provided that both the transferor and transferee have accounts at the same bank. In other words, it was not possible to transfer funds across different banks. In order to address this limitation, BOT developed an offline Media Clearing retail funds transfer system. Media Clearing is a convenient means for a customer in making interbank preauthorised debit / credit transactions that are large in volume and have a regular payment interval. ECH acts as a center for receiving and sorting information stored on electronic media, and calculating net balances for interbank settlement. Media Clearing started operation on January 16, 1997.

b. Regulations, Guidelines, and Policies

In order to ensure the smooth operation and service of Media Clearing system, there are regulations specifying roles and responsibilities between member banks and with ECH. The operating procedures and principles for resolving problems in the system are described in the following regulation and guideline:

i. The Bank of Thailand Regulation on Media Clearing 1997

The regulation is applied to both member banks and ECH. Following the regulation, there are 3 additional BOT notifications on operating hours, service fees and settlement operations for retail funds transfer.

ii. Media clearing guideline for commercial bank's customer services

In view of consumer protection, the guideline was drafted for member banks to follow in making funds transfer agreement with their clients.

c. Participants in the System

A member bank of the media clearing system must be an ECH member, and is officially authorised by BOT to operate Media Clearing. At the end of 2000, member banks totalled 27 banks, including 13 Thai commercial banks, 2 specialised banks, and 12 foreign commercial banks.

d. Funds Transfer Services

Media Clearing carries out 2 types of fund transfer services:

i. Credit Funds Transfer

Credit funds transfer is a fund transfer from the customer's account at one bank to another account at a different bank. They are, for example, salary, dividend, and interest payments.

ii. Debit Funds Transfer

Debit funds transfer is a pre-authorized funds transfer in which a customer has prior agreement with a bank for its account to be debited according to contractual terms such for the payment of insurance premium, mortgage and utility bills.

e. Operating Procedures

Client prepares details concerning the transferring of funds or pre- authorised account debits to the member bank.

- A member bank will sort out and verify in-house transactions before compiling other banks' funds transfer information and writing on the media in accordance with the specified standard. The media is to be forwarded to ECH.
- ECH verifies the information stored on the media. Should an error occur, the media, together with an error report, would be returned to the member bank for correction. Verified media are compiled for further

sorting, after which ECH calculates and records each bank's funds transfer details back onto the media, which are returned to member banks for processing.

- On receiving the media and the preliminary net clearing positions, the member bank will check the stored information and post to the customers' accounts accordingly. Unsuccessful or returned items will be sent back to ECH on the next effective date.
- When ECH receives the media storing the information of returned items from member banks, it will verify the information, sort the items, and write the information of the returned items onto the media and send to the transferor banks.
- The member bank will receive information on the returned items, and the information will be used to adjust customers' accounts and to notify the customers accordingly. The member bank also receives the interbank net clearing positions, which is useful for funds management before settlement via the BAHTNET system on the effective date.

Every step involved in the sending and receiving of funds transfer data between member banks and ECH utilises file authentication data security measure in order that both counterparties will be confident that the data is free from tampering during transmission. Moreover, each item processed at ECH will be protected by item authentication.

f. Processing Equipment

A computer is used by member banks to record funds transfer information onto electronic media such as magnetic tapes or discs. The media are brought to ECH for processing by sharing the processing equipment with the ECS.

g. Settlement Procedures

ECH will calculate the net clearing position and perform settlement via the BAHTNET system, debiting the net debitor banks' accounts and crediting the net creditor banks' accounts held at BOT according to the amounts calculated on the effective date.

If a net debtor bank has insufficient funds in its BOT account to cover payment and is unable to deposit sufficient funds within the time limit, then that settlement will deem void. Other banks will be notified and a new settlement calculation will be made, excluding items involving the defaulting

bank. New net clearing positions are posted to member banks, followed by further crediting or debiting according to the new calculation.

h. Pricing Policy

- BOT provides media clearing services to encourage the use of electronic media in place of cash or cheques for making payments. This will be beneficial to the efficiency and cost effectiveness of the economic system as a whole. The pricing of services is based on creating the incentives to use the system, rather than being based on a profit motive.
- In order to motivate member banks to send in advanced information, which would help to distribute evenly ECH workloads, fees are calculated at different rates, depending on the timing of the information being sent. If member banks send information many days ahead, their fees will decrease accordingly.

i. Contingency Plans

Since the media clearing system shares computer resources with ECS, it also benefits from a backup site located at the BOT head office (Bangkhunprom). As with ECS, programmes and most recent data are backed up at the backup site at the end of each day.

2.1.3.4 BAHTNET System

a. Background

As a result of the rapid economic and trade expansion experienced by the country, daily payment transactions grew in terms of both volume and value. Meanwhile, there were a limited number of payment instruments. Large-valued payments were generally made using cheques, cashier cheques, or BOT cheques. Therefore, in order to facilitate high-valued transactions, and to reduce costs and systemic risks, BOT has developed an electronic large-value funds transfer known as the Bank of Thailand Automated High-value Transfer Network (BAHTNET). It is a financial infrastructure that supports payment system developments, which is a pre-requisite for an international financial center. BAHTNET began its operation on May 24, 1995.

b. Regulations, Guidelines, and Policies

Members of BAHTNET system have to maintain current accounts at BOT and abide by the BOT Regulation on BAHTNET 1995. The regulation specifies the authority, roles and responsibilities of BOT, in its capacity as the service provider, and the members. The regulation also specifies the types of services and the guidelines for using the services.

In the event of a dispute, BOT and the Thai Bankers' Association will each appoint an arbitrator, both of which would appoint an outsider as another arbitrator, thus forming the arbitrating committee.

As for a third-party transfer, in which a commercial bank provides a service to its client in transferring funds via the BAHTNET system into a receiver's account at another bank, the service must abide by the BAHTNET Funds Transfer Guideline for Commercial Bank's Customer Service. This is to ensure fairness to the customers who use the services. However, there is currently no specific law governing funds transfer or electronic funds transfer. Therefore, should a dispute arise, the case must proceed according to the Civil and Commercial Code.

c. Members of BAHTNET

BAHTNET members, who must maintain deposit accounts with BOT and possess the required attributes, can be classified into 3 types, namely:

i. Direct Member

A direct member is a member who is able to send funds transfer transactions, receive funds transfer, and perform other functions using its own workstation subsystem (WS), which is directly connected to a BAHTNET Host Computer (BHC).

ii. Associate Member

An associate member is a member who uses a direct member's WS subsystem to send and receive funds transfers.

iii. Other Member

Other member is a member who can only receive funds transfer to its account via BOT's WS subsystem.

When the BAHTNET system began its operation, there were 33 direct members consisting of Thai commercial banks, foreign commercial banks, BOT itself, and the Industrial Finance Corporation of Thailand (IFCT).

As of December 31, 1999, direct members were as follows:

Thai Commercial Banks	13
Foreign Commercial Banks	21
Specialised Financial Institutions	5
Finance Companies and Finance and Securities Companies	10
Thailand Securities Depository Co. Ltd., (TSD)	1
BOT and Financial Institutions Rehabilitation and Development Fund (FIDF)	6
Government Agencies	2
Total	**58**

d. BAHTNET Services

The system operates daily from 8:30 a.m. to 5:30 p.m., except on bank holidays. It offers the following services:

i. Funds Transfer

A member can transfer funds from its account to another member's account or between its own accounts at BOT.

ii. Third Party Funds Transfer

Third-party funds transfer is a funds transfer on a client's order, from the client account to a beneficiary account at another bank. The service is available nationwide.

iii. Inquiry

A member can access to the information pertaining to its own current account at BOT, i.e., the account balance and its movements, and inquire the status of items in a queue and those already processed.

iv. Bilateral Communication

A member can communicate with another member via the BAHTNET system at any time during the operating hours.

v. Message Broadcast

Normally used to broadcast messages from BOT, this feature allows a member to broadcast messages to all members. A member simply sends the message to BOT, who would then broadcast it over the system.

vi. Multilateral Funds Transfer (MFT)

This is a BAHTNET function that allows a number of simultaneous debit/credit funds transfers. It is used by BOT for making daily settlements, for example, for ECS and media clearing purposes.

e. Operational Procedures

i. Funds Transfer

A member can send a fund transfer order through their WS subsystems, which is connected to BHC. As soon as the BAHTNET system recognises the funds transfer order, it passes the order on to the BOT current account system for verification and balance checking, making sure that the payer has sufficient funds in the account to cover the request. Once satisfied, the system automatically debits the transferor's account and credits the transferee's account and immediately dispatch debit and credit advices accordingly. A fund transfer order with insufficient funds will be queued, and will be processed automatically once the account balance topped up to the required level. Orders that remained unexecuted at the end of the day will be cancelled, and the notifications sent to the transferors immediately.

ii. Inquiry

A member may inquire the number of incoming and outgoing items, and check the status of its connectivity with BHC. For the inquiry on account balances and movements, the inquiry will be sent to the BHC which will then be forwarded to the BOT current account subsystem for further inquiry processing.

iii. Bilateral Communication

A member uses its WS subsystem to send messages, via BHC, to be printed out at the receiver's WS subsystem.

iv. Message Broadcast

A member sends the intended broadcast message in printed form, facsimile, or bilateral communication to BOT. If approved, BOT would use its WS subsystem to broadcast the message to all members of WS subsystems via BHC. The messages will appear on screen and will be printed out as well.

f. Processing Equipment

The BAHTNET system comprises of 3 subsystems as follows:

i. Workstation (WS) Subsystem

A workstation (WS) subsystem is a computer network installed in a member's office. It can perform the BAHTNET functions as previously mentioned. The WS subsystem at BOT, however, can perform additional functions such as Multilateral Funds Transfer (MFT), Pre-Authorized Debit Transfer (PAD), and message broadcast.

ii. BAHTNET Host Computer (BHC) Subsystem

BHC is a computer network located at the BOT head office (Bangkhunprom). It functions as a message-switching center, receiving and sending messages between the WS subsystem and the current account subsystem.

iii. Current Account (C/A) Subsystem

This is BOT's current account computer system. The connection between WS subsystems and BHC subsystem is point-employing Protocol X.25 via the digital leased line from the Telephone Organisation of Thailand, operating at the speed of 9.6 KBPS (kilobits per second). A back-up connection is via an ordinary public switched line or a dial-up line.

g. Security Measures

With regards to sending and receiving data between the WS subsystems and the BHC subsystem, data security measures are as follows:

- For controlling the connection between a member WS subsystem and the BHC subsystem, 2 out of the 3 senior officers with funds transfer authority must enter their passwords as well as use master key codes stored on diskettes, each diskette contains different code data.
- For message authentication, Message Authentication Code (MAC) is used to ensure that both sender and receiver have been authorised for sending and receiving the data. This prevents the alteration of messages during the transmission process.
- A data encryption scheme is used to convert both the transmitted data and MAC into encrypted streams. This preserves the secrecy of the messages, preventing the theft of information.

When a message is received at the BHC or WS subsystem, the encrypted message goes through decryption, and MAC is verified.

The key used to generate MAC and encryption varies daily. Moreover, the keys also differ for different WS subsystems.

h. Settlement Procedures

BAHTNET is an irrevocable funds transfer system, which operates on a Real Time Gross Settlement (RTGS) basis. It requires greater level of liquidity than the traditional net settlement system. Therefore, the transferor must maintain an adequate amount of funds in its current account at BOT in order to be able to successfully execute the funds transfer order. However, the transferor may momentarily face liquidity shortage, which would halt the transfer order. The BAHTNET utilises the following mechanisms for handling such a situation.

- A Queuing Mechanism is used to help prioritise the unexecutable funds transfer orders, which are placed in a queue until such time as the account balance has enough funds to cover the funds transfer orders.
- A Gridlock Resolution system is an optimisation process to help resolve a gridlock situation due to liquidity shortage. The system searches the queue for a combination of funds transfer orders that have a manageable net clearing position, in which case these funds transfer orders are executed simultaneously.

i. Liquidity Management

Due to the high degree of liquidity required to operate the BAHTNET system, BOT enables more efficient liquidity management for members by providing the following facilities:

- Intraday Liquidity Facility (ILF) provides the needed liquidity to BAHTNET members on an intraday, fully collateralised basis. A BAHTNET member can sell its securities to BOT with a contract to buy back on the same day, hence a repurchase or repo operation.

- The extension of the BAHTNET services enables a member to make on-line funds transfer among its accounts maintained at the BOT head office as well as the four BOT regional branches in Chiang Mai, Lampang, Khon Kaen, and Hat Yai.

- The centralised settlement of provincial interbank cheque clearing via BAHTNET allows member banks to manage the funds between their branches more efficiently.

j. Pricing Policy

BOT has developed BAHTNET as a financial infrastructure to increase the efficiency while reducing systemic risks within the payment system. There is no profit motive. In fact, the BAHTNET fee structure is meant to encourage potential electronic funds transfers as opposed from paper-based system.

With regards to the setting of service fees charged by member banks to their clients, BOT lets the market mechanism work freely.

k. Risk Management

BAHTNET funds transfer is based on RTGS and is irrevocable. As such, it is a system with a high degree of risk control. Items that cannot be settled immediately would be placed in a queue, and the transfer orders would only proceed when funds are sufficient. Unexecuted orders that remained in the queue at the end of the day would be cancelled. The built-in features imply that BAHTNET is a relatively safe payment system. In any event, BOT continues to push for high-value transactions, i.e., interbank lending, and foreign exchanges, to be executed via BAHTNET. Moreover, there is a plan to introduce a delivery versus payment (DvP) system for securities transaction within the BAHTNET framework.

l. Backup Solutions

The BAHTNET has been designed to operate continuously during the opening hours. With that requirement, there are backup systems both in terms of equipment and procedures. These are as follows:

- Both the BHC and current account computers are of a fault tolerant design, able to operate in the event of component failure, allowing repairs without a pause in the operation.
- When the main connection lines between WS subsystems and BHC fails, members can use a dial-up line as a backup.
- If a member of WS subsystem, or its connection, cannot be established with BHC connection, members can still use the backup methods. A member can place a telephone call to BOT to request funds transfers, or a member can use BAHTNET's Message Input Service (MIS) to request BOT to perform funds transfers on its behalf.
- BOT has set up BAHTNET system backup site at the BOT Surawongse office, to be used in the event that the main centre encounters a system break down.

2.1.3.5 ATM Network

Automated Teller Machine, or commonly known as ATM, is among the more popular banking tools introduced by Thai commercial banks. Since its introduction, BOT encouraged commercial banks to share ATM machines in order to minimise redundant investment costs. In the initial phase, there were two ATM networks, namely the BANKNET, led by the Bangkok Bank, and the SIAMNET, led by the Siam Commercial Bank and the Thai Farm-

er's Bank. In 1993, BOT pushed commercial banks toward establishing a common ATM Pool as a single ATM network operating throughout the country. As a result, the public experiences greater convenience, which later drives the foreign banks to join the network. At the end of 2000, there were 5,901 ATM machines nationwide, with daily transactions and values averaging approximately 1.05 million transactions and Baht 3,525 million.

Transactions on an ATM machine owned by a different bank would be processed by Processing Center Co. (PCC), which acts as the Switching Center for the interbank ATM network. Each commercial bank calculates its own net clearing positions by 9:00 a.m. of the next working day. The Bangkok Bank acts as a settlement bank, and each ATM pool member opens a current account with the Bangkok Bank. Commercial banks with net debit clearing positions will transfer funds to their Bangkok Bank accounts via BAHTNET by 2:00 p.m., afterwards Bangkok Bank will settle the accounts by 3:30 p.m. However, the fees commercial banks charged each other for using another bank's ATM are settled once a month by the same method, with PCC calculating the net clearing positions.

As has been mentioned earlier, ATM Network is also used as a small value funds transfer across commercial banks which is called an Online Retail Fund Transfer (ORFT). At present there are 11 banks that offer ORFT to their customers.

There is also an initiative effort from some commercial banks to provide e-payment services via ATM Network.

2.1.3.6 EDC Network

Electronic Data Capture or EDC machine is a device that a credit card issuing bank installs at a merchant store. Its main function is to authorise or reject the use of credit cards by cardholders. In addition, EDC machines can be used with debit, ATM, and stored- value cards, provided a pin pad or a chip reader is added. Presently, a typical shop may have many EDC machines, each of which is taking only one kind of cards, so that there would be, for example, one for Visa and one for MasterCard. This is due to the fact that each bank wants to maximise transactions for the acquiring banks. The trend resulted in approximately 50,000 EDC machines being used (as of mid 2001) throughout the country, a rather high figure in comparison with the values of card usage. Most EDC machines are installed within major metropolitan areas.

Settlements between issuing and acquiring banks can be categorised into 2 types as follows:

(1) For settlements between domestic institutions, the credit card companies, i.e., Visa International and MasterCard International, processes the information received from member banks and notifies each institution its net clearing positions. In Thailand, Chase Manhattan Bank is the settlement bank for every bank that offers credit card services. It debits the net paying banks' accounts and pay banks with positive net positions with cashier cheques by 11:00 a.m. on each day. Settlement is considered complete once all the cashier cheques are effective.

(2) For settlements involving financial institutions abroad, the credit card companies process the information received from member banks and notifies the net clearing positions as well as the agreed-upon currency conversion rates, with representative banks abroad acting as the settlement banks.

2.2 Cross Border Payments

2.2.1 General Overview

International payment transactions cover the situation whereby the payer and/or the payee is not domiciled in Thailand. Such items include personal travel expenses, payment for goods or services, international trade, international securities trading, as well as foreign exchange transactions and capital movements.

Payment for such transactions could be carried out in a number of ways. Apart from foreign currency-denominated cash transactions, other means of payment are as follows:

2.2.2 Payment Methods

2.2.2.1 Traveller's Cheque and Personal Cheque

The most commonly used currencies of denomination include the US Dollar, Japanese Yen, Deutsche mark (now EURO), and Pound Sterling. Settlement proceeds by sending the actual cheques physically, for purposes of calculation and settlement, to the local representative banks of the currency denomination.

2.2.2.2 International ATM Network

The international ATM network is a global network principally comprising the following networks: PLUS, CIRRUS, and American Express. It thus enables the cardholders to withdraw cash in local currency from the local ATM. This type of service minimises the need to carry cash and/or traveller's cheque and reduces the steps and time necessary to obtain local-currency cash. Via an on-line computer system, the ATM cardholder's account will be debited automatically each time the card is used. In addition, VISA, MASTER, and American Express cardholders can withdraw money from such a networked ATM as well. With regards to clearing and settlement between the ATM-operating bank and the ATM/credit card-issuing bank, the service provider performs the clearing process, while the representative bank handles the settlement.

2.2.2.3 International EDC Network

In addition to providing the infrastructure for domestic credit card and debit card payment, the Electronic Data Capture (EDC) and EFTPOS network also handles international credit card usage. The most popular cards used for international payment are VISA, Master, and American Express card, of which most banks are members and issuing institutions.

These cards owed their popularity to the convenience and universal acceptance of shops, hotels, restaurants, and businesses all over the world.

For clearing and settlement, the credit card company's transaction and processing centre will use its computer system to calculate net clearing position, which will then be sent to the settlement bank.

2.2.2.4 Payment in International Electronic Commerce

International electronic commerce transactions, particularly those trading over the Internet, have been on the rise. In Thailand, the means of payment over the Internet are mainly credit card while international electronic funds transfer and electronic money are less frequent.

As to the clearing and settlement of electronic money, the issuing institution abroad will transfer the electronic money directly to and from payee and payer respectively.

2.2.2.5 Payment via the Deposit Account

A business entity in Thailand that is allowed to open a foreign currency deposit account at the financial institutions in Thailand will be able to transfer funds from the account for payment of transactions payable in foreign currency. Besides, a non- resident entity is allowed to open a Thai baht deposit account, which enables the payment via the deposit account for transactions being done in Thai baht.

2.2.2.6 International Banking Funds Transfer

International banking funds transfer order is normally done through S.W.I.F.T message carrier network, which all commercial banks are members. Funds transfer order will be sent from a local sending bank to their respective correspondent banks through S.W.I.F.T message carrier network and then the correspondent bank will transfer funds from sending bank account to receiving bank where payee account will be credited.

2.2.3 Structure, Operation and Administration

Participants in the system are FX traders, exporters, importers, and individuals. Transactions handled are FX transaction settlements, settlement of goods and services exported or imported, and remittance of individual's requests. The major operators of cross border payments are local commercial banks and their correspondent banks overseas using S.W.I.F.T. as their message carrier. As it has been known that correspondent banks have been widely used for cross border payments. There have been some initiatives to reduce risks associated in cross border payments. Those are the Continuous Linked Settlement (CLS), which will reduce settlement risk in foreign exchange transactions, and e-payment for cross-border Business to Business e-commerce.

3. The Implications of the Existing Payment and Settlement Systems for Financial Stability

3.1 Monetary Policy

A number of developments have been taken to assure the country's financial stability, as follows:

- The development of BAHTNET/2, which covers the government security transactions on a DvP basis. This will result in the reduction of systemic risk in payment systems to a certain extent.
- The initiative to smoothen the level of liquidity throughout the day by encouraging all member banks to have their transactions executed within the specified time agreed upon by them. This will reduce the volatility of interest rate during the day, which will promote financial stability.
- The merging of the present 5 rounds of clearing and settlement system to one round is a viable solution and its implementation will greatly ease the liquidity needed for each round and further maintain financial stability.
- Not only the existing payment and settlement systems have implications on the financial stability, certain measures on financial stability policy itself has posed some problems to the payment and settlement system as well. The BOT announcement which will not allow commercial banks to grant non-resident customers an overdraft exceeding 50 million Baht (approximately $1 mil) has created a liquidity problem in the BAHTNET.

3.2 Payment System Oversight

The main objective in supervising the payment system is to ensure fairness for service-providing banks and their customers, control the commercial banks' cost of investment, and advise banks with regards to providing any kind of electronic funds transfer services. BOT has defined its roles on these matters as follows:

- Regulate and supervise the payment system by issuing operating guidelines for commercial banks with regards to providing payment services, for instance, guidelines for providing electronic funds transfer services, guidelines for third-party transfer through BAHTNET, and guidelines on Media Clearing.
- With regards to cash withdrawal using ATMs, BOT has the policy of having commercial banks utilise a common ATM network (ATM pool), with one network serving the entire country. This should lower the commercial banks' cost of investing in ATM machines. With regards to ATM service fees, BOT intends to foster open competition according to the market mechanism, but nonetheless supervises the fee structure in order to ensure an adequate level of consumer protection.

- With regards to establishing the On-line Retail Funds Transfer (ORFT) network, BOT supports commercial banks, through the Thai Bankers' Association, in providing retail interbank funds transfer via the ATM network. Eleven commercial banks presently have provided the service.

BOT is responsible for the payment system, supervising as well as advising, seeking to ensure that the payment system embodies the following characteristics:

- Minimises risk, in particular the systemic risk.
- Ensures fairness to all parties involved.
- Efficient, meaning convenient and fast services, low costs in making payments, reliable results, flexibility to deal with varying operating conditions.
- Variety of means of payment in which the service users can choose according to different situations.

The above objectives are to be achieved by:

- Encouraging financial institutions to employ RTGS instead of Net Settlement when making certain types of payment transactions, thereby reducing systemic risk.
- Issuing relevant regulations and guidelines to ensure orderliness in the system usage by members, shore up public confidence, and protect consumers, i.e., regulations on payment system uses, guides for providing fair payment services to customers, rights and responsibilities between payment service providers and their clients, etc. And with guidelines comes the supervision to ensure compliance.
- Pursuing the relevant legislation that serves as the legal infrastructure to the payment system.
- Coordinating with and supporting the development of payment systems that belong to the public and private sectors, i.e., in the form of advices, participation in working groups, and guidelines issued in support of system development, etc. Always rest on the principle of encouraging competitions and market mechanisms.
- Steps in when a dispute arises, or when there are petitions.

3.3 Competition/Innovation[2]

The level of competition in the Thai payments system market is at best a grey area. There is no in-depth and reliable study that determines the overall competitive nature of the Thai banking industry, let alone describes industry practices in payment systems.

This is not surprising, since it is difficult to find a perfectly competitive industry that fits theoretical definitions. There are often areas where improvement toward more competition can be made. For payment systems in Thailand, the following measures may be desirable:

- Price Transparency. Commercial banks must publicly announce the current price caps on all of their payment services to all user groups.
- Independent Fee Setting. The fees for all payment systems should not be set collectively. Rather, banks should be encouraged to set fees independently, within the price caps initially, according to demand and supply of each payment product. This is an important step toward the liberalisation of payment fees in the future.
- Removal of Anti-Competition Laws and Regulations. Some laws or regulations may prevent or discourage potential service providers from entering the market. They should be amended.
- Fair Inter-Bank Payment Transactions. Since inter-bank payments involve more than one bank, the terms of business between the banks must be fair. The branch network conflicts related to Media Clearing and BAHTNET are good examples of unfair arrangement. On the other hand, banks should be allowed to negotiate access prices so that the network owners will not use the access pricing to monopolise the markets unfairly for these two payment products, and competition will be less restricted.

A thorough study of competition in the banking industry, especially those aspects related to policy and regulatory framework is deemed necessary. The study should also be able to determine the interactions between competition and technological innovations. The innovation from non-bank payment service providers has shown that they are worthy rivals of commercial banks.

2. From Bank of Thailand's "Payment Systems Pricing and Usage", Final Report.

4. Consumer Protection[3]

Some end-users feel that the security features in electronic payment is not adequate. This belief tends to be untrue technologically but may be justifiable with respect to the legal environment and institutional settings. In most cases, evidence of electronic funds transfer is not yet acceptable in legal procedures; current criminal laws may not be adequate and comprehensive when applied to electronic payment frauds; the overall system may be unable to insure itself against damages caused by mistakes in the transmission of payment information.

The making or amendment of relevant laws is thus a necessity, and perhaps the most important measure and a pre-requisite to encourage a wider application of electronic payment instruments. At present, the electronic signature and electronic transactions Bill are awaiting to be read and enacted by the Senate. Although it is difficult to gauge its impact on the various electronic payment systems, the Bill will certainly be a significant step forward.

A comprehensive arrangement is needed to address the complications arising from the irrevocable nature of the electronic fund transfer. Potentially, this could be done with legal arrangements, but the payment service provider community (banks, non-bank institutions and the BOT) should work towards building a credible system in this respect, and thus gains customer's confidence.

5. Recent Payment System Developments and Policy Initiatives

5.1 Recent Developments

The following are 5 topics on the recent developments:[4]

3. From Bank of Thailand's "Payment Systems Pricing and Usage" Final Report.
4. From Bank of Thailand's Recent Developments in Payment and Settlement Systems Paper.
   Presented at the 5th Meeting of EMEAP Working Group on Payment and Settlement Systems.

5.1.1 A Shift of Payment Method for High-Valued Payments from Cheque to BAHTNET with an Incentive to Encourage Electronic Payment by Providing Liquidity in BAHTNET

Since March 10, 2000, the Bank of Thailand has made a significant progress in settlement risk management by encouraging banks to reach an agreement among themselves to include 4 types of high-valued interbank transactions from cheque payment to BAHTNET namely, non-resident Baht account, Baht settlement for FX trading, interbank lending, and government securities trading transactions. This was aimed to reduce settlement risk in the cheque clearing system and to comply with the Core Principles for systemically important payment systems initiated by the Bank for International Settlements (BIS). As a result, the value of cheque cleared dropped sharply from 65 trillion baht in 1999 to 25 trillion baht in 2000.

In order to facilitate the migration of the transactions, the BOT lifted the charge for the ILF usage and allowed BAHTNET members to use their positive daily cheque clearing balance to repay for its ILF used on that particular day, provided that government securities are pledged against the usage. The maximum ceiling of ILF usage was also lifted allowing BAHTNET members to use ILF facility without any limit as long as the usage is fully collateralised. These measures are aimed to reduce cost and increase liquidity for the members of BAHTNET.

5.1.2 An Application of Web Technology to the Development of BAHTNET/2 and the Online File Transfer of Media Clearing System

The Bank of Thailand is currently developing BAHTNET/2 system to replace the current BAHTNET. The main features of BAHTNET/2 include a real-time automated DVP system for Thai Government securities trading and an application of S.W.I.F.T network as the funds transfer message carrier. However, for some participants who are not a S.W.I.F.T member, a web-based service via the BOT Web Portal will be provided to access BAHTNET/2. The project is expected to be completed in late 2001.

Services for participants other than funds transfer will be provided via the BOT Web Portal. These include inquiry of account balance and movement, queue management, message communication, and reports. For non-S.W.I.F.T BAHTNET participants, Web services will also facilitate funds transfer and DvP transactions.

Regarding security, digital signature and message encryption for BAHTNET Web service will be employed. Smart card and password will be used for logging on and connecting to the BOT. Asymmetric PKI (Public Key Infrastructure) will be employed to allow valid users access into the system by using SSL (Secure Socket Layer-SSLv3-128 bits key) and digital signature (RSA-1024 bits key). To ensure the security, our Web Portal Security will be assessed and vulnerabilities identified by our consultant.

Other than BAHTNET/2, Web technology is also applied to an on-line file transfer of Media Clearing System. Under former practices, the Media Clearing data must be sent to the Electronic Clearing House (ECH) in a diskette format or a magnetic tape for two working days before the value date. With the application of Web technology, Media Clearing data are sent on-line to the ECH 1 working day prior to the value date.

The system migration took place in two phases. The first phase, beginning on December 1, 2000, allowed members to send data via an on-line system two days before the value date. This was to test the readiness of the hardware and software installation and members' connecting network. For the second phase, beginning February 1, 2001, window service for on-line file transfer data is opened until one working day before the value date.

5.1.3 An Initiative by the Private Sector in the Development of Electronic Money

To date, there are two major multipurpose electronic money schemes. One is Microcash, which has been implemented full-scale in the Bangkok Metropolitan Area since 1996, to pay for bus fares, cinema tickets and for goods and services at designated merchants. The other is a closed-system electronic money scheme, which is cooperation between local commercial banks and universities to make payments for tuition fees, and purchases at the university bookstore and shops.

There is evident trend that e-money is gaining popularity and increase in usage. Recently, C.P. Seven Eleven Public Co. Ltd., in co-operation with a consortium of three large commercial banks, Compaq Computer (Thailand) Co., CashCard International Pte Ltd., and Visa International (AP) Ltd. have carried out a project on e-purse employing smart card technology. C.P. Seven Eleven is a convenient store with a large branch network of about 1500 branches in 2000. In addition, the store provides utility payment services for water, electricity, telephone bills and others. The project looks prom-

ising as C.P. Seven Eleven has a large customer base, and the consortium involves all key parties including banks, which will have to upgrade their ATM machines with a smart card reader.

The Bank of Thailand, in co-operation with the National Electronics and Computer Technology Center and other private sector organisations, have jointly determined standards for smart cards to ensure that various cards and equipment meet international standards and are secure. Another consideration is to monitor other potential smart card service providers who may enter the market without having to make similar investments in order to create greater benefits for the smart card system. The Bank of Thailand has provided recommendations and will act as a facilitator to oversee the technical security and consumer protection of the smart card project.

5.1.4 A Study on Payment System Pricing and Usage

In 1999/2000, the Bank of Thailand and the Thailand Development Research Institute Foundation has jointly conducted a study on payment systems pricing and usage in Thailand. The project was initiated out of the need for the Bank of Thailand to develop a coherent pricing scheme for the payment services it is providing to the payment market. The objective of the study was to devise a new pricing scheme that will promote a wider use of an efficient and low-risk electronic payment systems as opposed to the costly paper-based payment systems.

The study suggested that the following measures may be desirable. First, there is a need for price transparency. Banks should publicly announce price caps on all payment services to all user groups. Such price caps should be periodically reviewed, and in the long-term as the payment market becomes more competitive. Second, banks should be encouraged to set fees independently, within price caps, according to demand and supply of each payment product. This is an important step towards the liberalisation of payment fees in the future. Third, An amendment or removal of some laws or regulations that may prevent or discourage potential service providers from entering the market is needed. And fourth, there may be further research on the issues of competition in the banking industry, in particular, the relationship between payment systems policy and the broader regulatory framework.

The study has concluded that although the payment systems have undergone progressive technological developments during the past decade, the

system remained highly paper-based. Although the price factor is not the only determinant of payment choice, pricing has become a measure used to influence consumer behaviour in making their choice of payments. As such, paper-based payments should be priced higher than electronic methods to reflect actual costs and to promote cost-saving means of payments. As to for payment market structure, there is a need to foster competition in the payment services industry in order to reap greater benefits for the consumers.

However, the implementation of policy measures which will impact on the payment systems will require further research and also dependent on the economic environment and the timing of the policy measures.

5.1.5 An Initiative to Establish the Payment Systems Board

The Payment Systems Group is currently studying the possibility of setting up a Payment Systems Board, which will pursue the objective of continuously ensuring the safety, soundness and efficiency of payment and settlement systems infrastructure to effectively serve business and public policy needs. Its scope will be stretched to cover both present national payment services and new payment innovations. Its governance would include representatives from a broad range of interest groups, comprising senior central bank officials, representatives from private and academic sectors, and other external members that will represent the viewpoints of the public.

This initiative will be a follow-up to earlier work, which started with the establishment of a Payment System Development Committee in 1991. The committee functioned as a steering committee of the payment system and drew up plans to create basic infrastructure in the payment system, which subsequently led to the emergence of BAHTNET, Electronic Cheque Clearing System, and Media Clearing System. The committee comprising representatives from several departments in the BOT, which co-ordinated related activities with internal and external agencies. The Committee changed its name to the Payment Systems Committee in 1997, and is presently overlooking the functioning of the payment system.

5.2 Policy Initiatives

A number of policy initiatives which have been undertaken are as follows:

5.2.1 The Efficiency Enhancement of Media Clearing

The objectives are: (i) to promote the use of Media Clearing for making BOT and Government Agencies Transactions in order to discourage the use of cheque; (ii) to develop the system so that data can be fully exchanged through Web Technology which is more convenient and would speed up transaction time and promote efficiency in making on-line transactions; and (iii) to accommodate the private sectors e-commerce payments.

5.2.2 The Enhancement of Electronic Cheque Clearing System Efficiency

The objectives of the project are: (i) to employ technology in making cheque payments; (ii) to merge the Supplementary Cheque Return to Electronic Cheque Return System; and (iii) to expand the areas covered by the existing ECS to adjacent provinces.

5.2.3 The Improvement of Provincial Cheque Clearing System

The objectives of the project are to have the provincial cheque result known within three working days, and to promote the use of on-line signature verification and on-line accounting.

5.2.4 BAHTNET/2 Project

The project's objectives are: (i) to develop a real time delivery versus payment (DvP) system for scripless government securities which are registered at the BOT in order to serve as an infrastructure for the development of a primary and secondary market; (ii) to promote efficiency in the payment system and to serve members' needs; (iii) to extend BAHTNET services to cover the whole country in the next phase (via the General Comptroller's network); and (iv) to interface to international-standard system such as S.W.I.F.T. and other organisation internally and externally.

5.2.5 The Payment Systems Linkages

The objective of the project is to study the possibilities of linking BAHTNET system to other organisations both domestically and internationally to reduce payment system risks and to conform with international standard.

5.2.6 The Promotion of Knowledge on Payment Systems

The objectives are: (i) to promote the knowledge of services, uses, and impacts of payment systems to users of both BOT internal offices and external organisations and individuals concerned; (ii) to boost the use of electronic in making payment transactions as well as the use of payment systems developed by BOT as a choice for making payments; and (iii) to encourage the co-operation and better understanding between financial institutions in developing the interbank payment systems.

5.2.7 The Payment System Risks Project

The objectives of the projects are to locate, identify, and estimate the magnitude of risks associated with electronic payment systems and to propose the measure to manage associated risks and to determine the direction of developing the future electronic payment systems to contain associated risks.

5.2.8 The Payment Systems Strategic Direction Project

The objectives of the projects are: (i) to study and to analyse the Thai Existing Payment System infrastructure; (ii) to determine the Payment Systems Vision; and (iii) to formulate Payment Systems Strategy and direction.

6. Suggestions and Recommendations on the Role of Central Bank in Ensuring the Safety and Efficiency of the Payment and Settlement Systems

As with many other central banks, the Bank of Thailand has assumed the role as a service provider of the country's payment systems in needy areas that has to be undertaken by the public sector, ie. BAHTNET, ECS, and Media Clearing. The Bank of Thailand also supports payment system developments that are being undertaken by the public and private sectors in order to ensure that the country's overall payment system is fully integrated and efficient contributing to the overall welfare of the economy and in encouraging market mechanism in the setting of appropriate fee structures. In terms of safety and efficiency, BOT comply with the international standard criteriā of Systemically Important Payment Systems. The use of e-payment which interoperability has been taken into consideration.

The BOT, is facilitating the process of outlining the frameworks and development directions of the country's payment systems, will co-ordinate closely with the public and private sector, in ensuring that various form of transactions being currently developed are compatible with one another, and will complement the working of the country's monetary system. The study on the viability of electronic cash has also been made in which various organisations have been invited to share their views regarding the setting up of relevant standards. These include, for example, safety standard, data standard which will enhance compatibility between commercial and financial transactions, data sharing with clearing and settlement processes, and equipment sharing that will further support development in the payment system.

The Bank of Thailand has formally adopted inflation targeting as its monetary policy framework since the beginning of 2000. The current target is set at 0-3.5% with due consideration to growth and employment in light of the adverse impacts of the recent financial crisis. The aim of the monetary policy framework is to ensure economic and financial stability of the country necessary for sustained economic developments in the long term. In relation to the payments system, the framework will also ensure public confidence in the financial system in particular regarding the three major characteristics of money inherent in the payments and settlement system ie. the store of value, unit of account and means of exchange. Most importantly, inflation targeting may also be viewed as a crisis prevention measure, which would help to strengthen the risks management and conflict resolution frameworks underlying every international best practice payments system throughout the world.

The BOT normally conducts monetary policy through liquidity operations and moral suasion. Liquidity operations through the RP market and loan window need an efficient payment system. In this regard, the BOT is developing a real-time electronic delivery-versus-payment system (DvP) for settlement of government securities and BOT bonds.

Moreover, BAHTNET, which is primarily designed for large-valued fund transfers among banks, financial institutions, and government agencies, is expected to facilitate the flow and enhance the efficiency of fund usage. This will, in turn, improve efficiency of the financial system as a whole and also enhance its response to monetary policy conducted by the BOT.

In summary, the BOT has been aware of the relevant role of central Bank in ensuring the safety and efficiency of the Payment and Settlement Systems as mentioned earlier. The BOT in keeping with its core central banking function will strive its best to conduct policy initiatives in a practical manner in serving the corporate sector and the public at large.

Annex 1

Country Tables

Table 1. Major events affecting the payment and settlement systems

Date	Major Development
24 May 95	BAHTNET, the real-time high value interbank funds transfers have been in operational.
24 May 96	Clearing and settlement of provincial cheques has been implemented.
16 July 96	Electronic Cheque Clearing System (ECS) has been in operational.
16 Jan 97	Media Clearing an off-line retail funds transfer has been implemented.
10 Mar 00	4 types of interbank transactions were forced to settle through BAHTNET.
1 Dec 00	On-line Media Clearing has been implemented.

Table 2. Selected Country Indicators

	1995	1996	1997	1998	1999
Population (millions): Year end	59.28	59.90	60.50	61.17	61.78
GDP (Billions of Baht)	4,192.7	4,622.8	4,740.2	4,628.5	4,615.4
GDP per capita (baht)	70,727	77,175	78,350	75,666	74,707
Exchange Rate (against USD)					
Year end	25.19	25.61	47.25	36.69	37.52
Average	24.89	25.32	31.32	41.31	37.79

Table 3. Settlement media used by non-banks at year end (millions of baht)

	1995	1996	1997	1998	1999
Notes and coin	333,586	371,860	400,921	376,778	587,396
Transferable deposits	-	-	-	-	-
Narrow money supply (M1)	388,276	423,686	428,785	441,732	575,040
Memorandum item:					
Broad money supply (M2/M3)	4,463,548	5,007,950	5,169,700	5,629,803	5,718,737

Table 4. Settlement media used by banks

	1995	1996	1997	1998	1999
Reserve balances held at central bank					
Of which: (billions of baht)					
Required reserves	211	245	241	261	266
Free reserves	43	45	107	433	445
Transferable deposits	-	-	-	-	-
Memorandum item: (billions of baht)					
Institution borrowing from central bank	36.2	53.8	313.1	154.5	48.3

Table 5. Institutional Framework (1999)

Categories	Number of institutions	Number of branches	Number of accounts	Value of accounts (Millions of Baht)
Central Bank	1	5	1,196	107,567
Commercial:				
ThaiBank	13	3,254	N.A.	4,403,664
ForeignBank (include BIBF)	36	-	N.A.	246,439
Development and investment banks:				
Public (IFCT)	1	34	-	-
Private	-	-	-	-
Foreign	-	-	-	-
Special Finance houses	4	1,153	N.A.	611,394
Money Exchangers	252	-	-	-
Post Office	1	1,145	-	-

Table 6. Cash dispensers, ATMs and EFTPOS terminals

	1995	1996	1997	1998	1999
Cash dispensers and ATMs:					
Nos. of networks (year-end)	1	1	1	1	1
Number of Machines (year-end)	3,236	4,284	4,835	5,188	5,322
Volume of transactions (during): thousands	238,325	274,737	323,719	370,830	333,585
Value of transactions (during): millions of baht	536,277	656,744	780,814	818,562	938,150
EFTPOS:					
Number of networks (year-end)	1	1	1	1	1
Number of Machines (yea-end)	N.A.	N.A.	N.A.	N.A.	N.A.
Volume of transactions (during)	N.A.	N.A.	N.A.	N.A.	N.A.
Value of transactions (during)	N.A.	N.A.	N.A.	N.A.	N.A.

Table 7. Number of payment cards in circulation (at year-end, in thousands)[4]

	1995	1996	1997	1998	1999
Cards with a cash function	13,962	15,557	17,823	15,698	17,466
Cards with a debit/credit function[5] Of which					
Cards with debit function	N.A.	N.A.	N.A.	N.A.	N.A.
Cards with credit function	1,895	1,972	2,010	1,907	1,574
Cards with a cheque guarantee function	-	-	-	-	-
Memorandum item: Retailer cards	N.A.	N.A.	N.A.	N.A.	N.A.

Table 8. Payment instructions handled by selected payment systems: vol. of transactions (Thousand)

	1995	1996	1997	1998	1999
Credit transfer (BAHTNET)	8	101	178	243	255
Giro System (Media Clearing)	-	-	274	1,405	2,786
Interbank Clearing House (Cheque: ECS)	70,414	70,793	65,165	52,476	51,380
Cheque (all country)	95,543	93,878	85,779	69,441	68,797
Post Office:					
Postal money orders	N.A.	N.A.	N.A.	N.A.	N.A.
Postal cheques	N.A.	N.A.	N.A.	N.A.	N.A.

Table 9. Payment instructions handled by selected payment systems: value of transactions (Billion of Baht)

	1995	1996	1997	1998	1999
Credit transfer (BAHTNET)	1,240.8	8,177.4	14,525.3	16,464.8	6,602.7
Giro System (Media Clearing)	-	-	8.32	58.85	81.29
Interbank Clearing House (Cheque: ECS)	68,077	120,782	136,679	75,422	65,510
Cheque (all country)	70,475	123,276	138,735	76,966	66,926
Post Office:					
Postal money orders	N.A.	N.A.	N.A.	N.A.	N.A.
Postal cheques	N.A.	N.A.	N.A.	N.A.	N.A.

5. Most cards are multifunctional and may appear in several categories. It is therefore not meaningful you add the figures.
6. Overlaps with cards with a cash function.

Table 10. Indicator of use of various cashless payment instruments: volume of transactions (thousand)

	1995	1996	1997	1998	1999
Cheques issued	92,543	93,878	85,779	69,441	68,797
Payments by cards					
Credit cards	N.A.	N.A.	N.A.	N.A.	N.A.
Debit cards	N.A.	N.A.	N.A.	N.A.	N.A.
Paperless credit transfers	8	101	452	1,648	3,041
Postal money orders	N.A.	N.A.	N.A.	N.A.	N.A.
Postal cheques	N.A.	N.A.	N.A.	N.A.	N.A.

Table 11. Indicator of use of various cashless payment instruments: value of transactions (billion)

	1995	1996	1997	1998	1999
Cheques issued	70,475	123,276	138,735	76,966	66,926
Payments by cards					
Credit cards	132	150	149	147	152
Debit cards	N.A.	N.A.	N.A.	N.A.	N.A.
Paperless credit transfers	1,241	8,177	14,534	16,524	6,684
Postal money orders	N.A.	N.A.	N.A.	N.A.	N.A.
Postal cheques	N.A.	N.A.	N.A.	N.A.	N.A.

Table 12. Transfer instructions handled by securities settlement systems: volume of transactions

	1995	1996	1997	1998	1999
Government Security Trading	N.A.	N.A.	2,752	8,804	21,379

Table 13. Transfer instructions handled by securities settlement systems: value of transactions (Millions of Baht)

	1995	1996	1997	1998	1999
Government Security Trading	N.A.	N.A.	216,232	961,576	870,944

Glossary

Part A: Thai Institutions and Terminology

ATM Pool	A common network of Automated Teller Machine of commercial banks.
B/C	Bill for collection is a cheque sent for collection across different clearing houses.
BAAC	Bank for Agriculture and Agricultural Cooperatives.
BAHTNET	Bank of Thailand Automated High-value Transfer NETwork is an electronic network for funds transfer and financial information exchanges between member institutions.
BHC	BAHTNET Host Computer is the center BAHTNET system server computer situated at BOT, linking user workstations and the current accounts system at BOT.
BIBF	Bangkok International Banking Facilities.
BOT	Bank of Thailand.
Code line	A line space on a cheque, 0.125 inches in height from the bottom of the cheque, in which numbers and special symbols are printed, using magnetic ink, to designate 5 items, namely the cheque number, the bank and bank branch codes, the account number, the type of document, and the amount of money.
ECH	Electronic Clearing House.
ECHFEP	Electronic Clearing House Front End Processor is a computer that links between the member banks' networks and the ECH, used for sending/receiving cheque information.

ECS	Electronic Cheque Clearing System is a system for interbank cheque clearing, using electronic equipment to read cheque information, sending data to ECH, and net balance calculation and settlement.
EXIM	Export-Import Bank of Thailand.
GHB	Government Housing Bank.
GSB	Government Savings Bank.
IBF	International Banking Facilities.
ILF	Intraday Liquidity Facility is an amount provisioned by BOT for BAHTNET members to be able to proceed with funds transfer in the event that the transferor members do not have sufficient funds in the account with BOT. It is a part of the loan window.
MAC	Message Authentication Code.
Media Clearing	An off-line retail funds transfer system.
MFT	Multilateral Funds Transfer is a function of BAHTNET system used for interbank clearing and settlement.
MIS	Message Input Service is a BAHTNET service set up in the event that a client computer or user communication line is down. Here the orders are sent to BOT who would proceed on the client's behalf.
ORFT	On-line Retail Funds Transfer.
PAD	Pre-Authorized Debit Transfer is a type of funds transfer in the BAHTNET system. With prior agreements, BOT sends out funds transfer orders to debit from BAHTNET members' accounts and credit BOT's account.
PCC	The Processing Center Co. Ltd.
SEC	Securities and Exchange Commissions.

SET	Stock Exchange of Thailand.
TBDC	Thailand Bond Dealing Center.
TSD	Thailand Securities Depository Company.
WS Subsystem	Workstation Subsystem.

Part B: Standard Red Book Terminology

ATM (Automated Teller Machine)	Electro-mechanical device that permits authorised users, often using machine-readable plastic cards, to with draw cash from their accounts and/or access other services, such as balance enquiries, transfer of funds or acceptance of deposits; ATMs may be operated either on-line with real-time access to an authorisation database or off-line.
Book entry	An accounting system, which permits the transfer of claims (e.g., securities) to facilitate elimination of physical movement of paper documents.
Cash Dispenser	Electro-mechanical device that permits consumers, often using machine-readable plastic cards, to withdraw bank notes (currency) and, in some cases, coins; see *automated teller machine (ATM).*
Cheque	Written order from one party (the drawer) to another (the drawee, normally a bank) requiring the drawee to pay a specified sum on demand to the drawer or to a third party specified by the drawer; widely used for setting debts and withdrawing money from banks.
Clearing	A set of procedures whereby financial institutions present and exchange data and/or documents relating to funds or securities transfers to other financial institutions at a single location (clearing house). The procedures often also contain a mechanism for the calculation of participants' bilateral and/or multilateral net positions with a view to facilitating the settlement of their obligations on a net or net net basis. See also *netting.*

Credit Card Card indicating that the holder has been granted a line of credit. It enables him to make purchases and/or draw cash up to a pre-arranged ceiling; the credit granted can be settled in full by the end of a specific period, or can be settled in part, with the balance taken as extended credit. Interest is charged on the amount of any extended credit and the holder is sometimes charged an annual fee.

Credit Risk The risk that a counterparty will not settle an obligation for full value, either when due or at any time thereafter. In exchange for value systems, the risk is generally defined to include *replacement cost risk* and *principal risk.*

Credit Transfer One or more payment orders, beginning with the originator's payment order, made for the purpose of placing funds at the disposal of a beneficiary. In the course of a credit transfer, payment orders may be transmitted through separate *credit transfer systems.*

Daylight Overdraft Credit extended for a period of less than one business day; in a *credit transfer system* with end-of-day *final settlement*, daylight credit is tacitly extended by a receiving institution if it accepts and acts on a *payment order* even though it will not receive final funds until the end of the business day.

Debit Card Card enabling the holder to have his purchases directly charged to funds on his account at a deposit-taking institution (may sometimes be combined with another function, e.g., that of a *cash card or cheque guarantee* card).

Debit Transfer Funds transfer in which debit collection orders made or authorised by the payer move from the bank of the payee to the bank of the payer and result in a charge (debit) to the account of the payer; for example, *cheque*-based systems are typical debit transfer systems.

Decryption	The process of transforming encrypted data back into its original form.
Direct Debit	Debit on the debtor's bank account initiated by the creditor, based on the prior written agreement of the debtor.
DvP (Delivery-versus-Payment)	Phrases used to summarise the conditions that must hold if the counter-parties to a transaction in an exchange-of-value system are not to be exposed to principal risk (the risk that one counterparty loses the full value of the transaction); DvP in its most rigorous form implies that both the asset transfer and the related funds transfer are simultaneously irrevocable and unconditional for the parties involved.
EFTPOS (Electronic Funds Transfer at Point of Sale)	A terminal at a retail location which is designed to capture, and in some cases also transmit, payment information by electronic means.
Electronic Commerce, E-Commerce	Commercial activity that takes place by digital processes over a network. Most new business-to-business and business-to-customer transactions are being delivered on the Internet.
Electronic Money	Value stored electronically in a device such as a chip card or a hard drive in a personal computer.
Encryption	Scrambling computerised information to secure data by using special algorithms for transmission or other purposes. Passwords are stored within the system and are often encrypted, so that even when unauthorised access of their file takes place, they cannot be read or understood.
Finality	Refers to the point at which the final and irrevocable transfer of value has been recorded in the books of the relevant settlement institution. The timing of settlement can be any of the following: immediate, same day (end of day), next day.

Gross Settlement	A transfer system in which each *credit transfer* or *debit collection* order is settled individually (i.e., without netting debits against credits).
MICR (Magnetic Ink Character Recognition)	A technique by which documents are read by machines for electronic processing.
Netting	An agreed offsetting of positions or obligations by trading partners or participants in a system. The netting reduces a large number of individual positions or obligations to a smaller number of positions. Netting may take several forms, which have varying degrees of legal enforceability in the event of default of one of the parties.
Net Settlement	A *netting* system in which *direct participants* settle only their net net positions resulting from the clearing process; see also *clearing.*
PIN (Personal Identification Number)	The alphanumeric code which the cardholder may need to quote for verification of identity. In electronic transactions, it is seen as the equivalent of a signature.
Prepaid Card	Card loaded with a given value, paid for in advance.
RTGS (Real Time Gross Settlement)	A gross settlement system in which each transaction is processed and settled in real-time. This means that settlement takes place at the same time as or before the instruction is passed to the transferee.
Securities Depository	A facility for holding securities which enables securities transactions to be processed by book-entry. Physical securities may be immobilised by the depository or securities may be dematerialised (i.e., so that they exist only as electronic records). In addition to safekeeping, a central securities depository may incorporate *comparison*, *clearing* and *settlement* functions.

Settlement Completion of a payment or the discharge of an obligation between two or more parties. Frequently used to refer to the payment or discharge of interbank transactions or a series of prior existing transactions.

Settlement Risk General term used to designate both credit and liquidity risk in a transfer system, i.e. the risk that a party will fail to meet one or more obligations to its counterparties or to *a settlement agent or settlement institution.*

Smart Card A credit card containing an integrated circuit that gives it a limited amount of "intelligence" and memory. Smart cards are being used for identification and to encode information such as a person's medical history.

S.W.I.F.T. (Society for Worldwide Interbank Financial Telecommunication) An international financial transaction message network. Created and owned by banks, the network is also available to some categories of non-bank institutions.

Systemic Risk The risk that the failure of one *participant* in an *interbank funds transfer system* or securities settlement system, as in financial markets generally, to meet his required obligations will cause other participants or financial firms to be unable to meet their obligations when due.

Chart : Payment Systems in Thailand

	Domestic Payments	International Payments
Bank of Thailand	**1. BAHTNET : A high value real time gross settlement for interbank funds transfer** **2. Electronics Check Clearing System -ECS** **3. Media Clearing : A retail offline funds transfer cross commercial banks for their respective customers**	**17. SWIFT** Draft

Settled at Account held at BOT/Correspondent Banks

	Intrabank	Interbank	International Payments
Commercial Banks & Specialized Banks	**4.Tele Banking** **5. Internet Banking** **6. E-Bill payment and other payments** **7. E-commerce payment gateway** **8. Bill Payment (Counter service)** **9. Direct debit & direct credit** **10. Smart Card** **11. Financial Electronics Data Interchange (FEDI)**	**12. Online Retail Funds Transfer (ORFT) :** customer retail cross banks funds transfer via ATMS **13. EFT/POS** (Electronic Funds Transfer at Point of Sales) **14. Credit card** **15. Debit card** **16. Cheque, Draft, Bill of Exchange (B/E)**	**17. SWIFT** Draft Credit Card

Settled at Account held at Commercial Banks

	18.			19.	20.		23. Domestic and International Funds Transfer
Nonbank and Payment Service Providers	**Covenience Stores**	**Telecom Co.**	**Post Office**	**Others**	**Credit Card Co.**	**Payment Service Providers**	
	CP Seven Eleven, AM/PM Bill payment & other payments	AIS, TAC, Telewiz, etc. Bill payment & other payments	Money Order Bill payment & other payments	AEON Central Card Lotus card Jusco card GE	AMEX DINERS	**21. EBPP** (Electronics Bill Presentment&Payment) **22. E-Commerce payment** gateway	Western Union

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