

PAYMENT SYSTEMS REPORT

2003



June 2004



Summary of key statistics in 2003

Population: **62.77** million

Gross Domestic Product (current price) : **B5,939.06** billion

Technological Infrastructure:

- Number of fixed network telephone subscribers per 100 inhabitants: 10
- Number of mobile telephone subscribers per 100 inhabitants: 36
- Number of Internet users per 100 inhabitants: 10



Payment statistics:

- Number of Thai commercial banks: 13 with 3,730 branches
- Number of foreign commercial bank branches: 18 branches
- Number of specialized financial institutions (banks only) : 6 with 1,268 branches
- Number of postal office branches: 1,148 branches
- Number of Automated Teller Machines (ATM): 9,118 machines
- Number of credit cards issued by financial institutions: 4,224,362 cards
- Number of ATM cards: 29,666,295 cards
- Currency in circulation per capita as of 31 December 2003: 8,587 baht
- Number of cheque usage per capita: 1.5 items per year
- Monthly average value of credit card payments by Thai citizen: 4,065 baht per credit card
- Monthly average value of ATM cash withdrawals: 6,230 baht per ATM card

Message from the Chairman

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The Bank of Thailand established the Payment Systems Committee (PSC) with the objective of formulating payment policy and directions to improve efficiency and reduce potential risks in the national payments system. It also has the duty to push forward the Thai payments system as a major strategy in developing the regional economic co-operation.

Private sector participation in formulating payments policy

Developments in 2003 were successful as a result of good co-operation and co-ordination among the Bank of Thailand, public sector agencies, and related organizations from the private sector. This involved participation in policy formulation, guidelines for providing payment services, and common technical standards. Such co-operation benefited efficiency, reduced duplicative investments, and created fair competition for all parties.

The PSC established the Subcommittee on National Payments Co-operation that comprises representatives from commercial banks and Thailand Post whom are involved in policy development and co-operate to accomplish the work. Seven working groups were set-up to study and resolve major problems as follows: Working Group on Electronic Money, Working Group on Barcode Standard, Working Group on Payment Association Survey, Working Group on SMART, Working Group on Cheque Truncation, Working Group on ITMX, and Working Group on International Payment Gateway Survey. The PSC will promote and support the subcommittee in strengthening its co-operation and formation in becoming an independent organization that is fully backed by law and regulated.

Developments in emerging payment systems

The Interbank Transaction Management and Exchange (ITMX) system originated from the Committee on Payment Infrastructure and Standards. This system further

develops the interbank retail payments that may be linked to all payment systems and payment means, and supports the growth of electronic commerce transactions. In 2003 the PSC agreed in principle on the organizational structure for implementing the ITMX system, the investors, the members, the type of transactions. The Bank of Thailand will have the power to regulate the organization implementing the ITMX, which is expected to be operational in 2005.

In addition, the PSC views the importance of developing the payments system as a national strategy to support the use of regional currencies. This involved co-operation with Singapore, Malaysia and Indonesia in developing infrastructure for a cross-border retail payments system, called ASEANPay, to support the expansion of trade in the ASEAN region, and to increase the competitiveness of the economies with respect to other regions. A working group, comprising of senior-level executives from central banks and commercial banks, has been established in each respective country,

Work on efficiency improvements in the payments system

The payments system has become a very important role in the Thai economy, where the total value of payments in 2003 amounted to 18 times the value of Gross Domestic Product (current price) as the daily average value of funds transferred amounted to B430 billion. Despite the low ratio per capita when compared to other countries, the effort in developing and encouraging the use of various payment means resulted in the downward trend in the number of cash usage to other payment means in 2003.

The PSC has given importance towards introducing risk prevention measures for the country's major payment systems, whereby such potential risks may have

Message from the Chairman

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serious implications towards financial institution stability and cause disruptions to the whole economy. In 2003 payment policy was focused on improving and developing the efficiency of the payments system to increase the number of various payment means to encourage economic savings, which will result in lowering costs and fees paid by consumers accordingly. Work carried out include the following:

- The Cheque Truncation Project includes development of the interbank cheque clearing system to reduce the physical transportation for cheque collection, to reduce the costs of cheque delivery, and to speed up the cheque collection and return processes.
- The Proactive Public Relations Project includes public relations through various media to create awareness and stimulate general public knowledge, understanding, and confidence in the widespread use of other payment means, such as electronic payments in substitution for cash and cheques.
- The Payment Systems Costs and Pricing Project includes the study of both the BOT and commercial bank payment services in order to develop fees for various payment means in accordance with their actual costs. The project also supports the competitive potential of such services resulting in an overall cost reduction for payment services.

Future plans

The three-year payment systems development plan (Payment 2004 A Road Map for Thai Payment Systems), formulated through a joint study and review of current payment infrastructure by the BOT and related agencies, was used as a guideline in setting the foundation in various areas since early-2002.

For the BOT, work on payment systems is considered a core strategic objective that requires promotion and support to achieve a well-developed payments system by 2007. The framework, to be carried out between 2004-2007, covers five strategies as follows:

1. Development of payment systems to cover all payment means as appropriate
2. Compliance of payment systems with the BIS Core Principles
3. Encourage the development of payment systems to support electronic commerce transactions
4. Having well-developed payment data
5. Preparation for the development of a delivery-versus-payment securities settlement system in conjunction with regional developments

The above strategies serve as a framework for development, which may require adjustments to modern developments, market changes, and the rapid change in payments technology. Such challenges would require a co-operative mechanism from all parties working in different areas and under various responsibilities to push forward a modern and efficient payments system that will fully benefit the stakeholders, thus further benefit the whole economy.



M.R. Pridiyathorn Devakula
Chairman, Payment Systems Committee
12 May 2004

Payment Systems Committee

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Chairman

M.R. Pridiyathorn Devakula
Governor

Duties of the Payment Systems Committee

(as stipulated under order 369/2544 on establishment of the Payment Systems Committee on 27 August 2001)

1. To formulate national payment policy directions and establish suitable and transparent technological standards.
2. To promote efficient payment systems, and support the use of new payment methods or services in the country, and cross-border linkages.
3. To oversee and determine risk reduction measures in the payment system, and consider the appropriateness of adopting standards set by international organizations.
4. To coordinate private sector development in a consistent manner to reduce basic infrastructure costs, and to regulate payment services they provide.
5. To publish an annual report to summarize the work of the Committee that is transparent and of good standard

Members

1. **Mrs. Nongnart Sondysuvan**
Assistant Governor, Information Systems
2. **Mrs. Nopamart Manoleehagul**
Assistant Governor, Operations
3. **Mr. Kirik Vanikkul**
Assistant Governor,
Financial Institutions Policy Group
4. **Mrs. Tasna Rajatabhothi**
Assistant Governor,
Financial Markets Operations Group
5. **Ms. Udomsup Techakampuch**
Assistant Governor, Supervision Group
6. **Mr. Tanin Mukdaprakorn**
Senior Director,
Deposits and Debt Instruments Group
7. **Dr. Chim Tantiyaswasdikul**
Senior Director,
Information Technology Group
8. **Mr. Serm Singh Sinhaseni**
Senior Director, Legal Group
9. **Dr. Thaweesak Koanantakool**
Director, National Electronics
and Computer Technology Center
10. **Mr. Manoo Ordeedolchest**
Honorary President,
Association of Thai Computer Industry
11. **Dr. Somchai Richupan**
President, Siam Development Institute
12. **Mrs. Saowanee Suwannacheep**
Commissioner, Electronic Commerce,
Electronic Transactions Commission

Member and Secretary

13. **Mr. Sayan Pariwat**
Senior Director, Payment Systems Group

As of December 2003



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Payments Policy in 2003

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The Bank of Thailand (BOT) established the Payment Systems Committee (PSC) on 27 August 2001. The committee is chaired by the Governor of the Bank of Thailand and includes qualified experts in various areas. It aims to formulate national payments policy to promote efficiency and safety, to respond to developments in payment technology, and to serve private sector needs.

Major policies endorsed by the PSC in 2003.

▶ Establishment of the Thailand Payments Association (TPA)

The PSC passed a resolution to establish the TPA as an independent organization supported with an explicit legislation. Due to the lengthy legal process, this has proceeded in the initial form of a Subcommittee on National Payments Co-operation under the PSC for one year and draws upon the BOT's powers in issuing relevant directives.

▶ Payment Infrastructure and Standard

The PSC agreed on the organizational structure for implementing the Interbank Transaction Management and Exchange (ITMX) system, the investors, the members, the type of transactions, and the directives. The BOT will have the power to regulate the organization implementing the ITMX, which is expected to be operational in 2005.

▶ Approaches to the Pricing Structure of Payment Means

The PSC approved the approach for setting the payment pricing structure based on the principle of 'increasing cheque fees and/or reducing electronic payment fees'. The Payment Systems Group studied the appropriate approach including the development of a forecasting model for payment means and the study on the cost structure of all payment means for both BOT and private sector payment services. The study sought co-operation from the Subcommittee on National Payments Co-operation. An external consultant was also commissioned to undertake the study in 2003.

▶ **Improvements in the Electronic Retail Payment System (SMART)**

The PSC determined the approach for improving account-based funds transfer instructions and the pricing structure for SMART to prevent the splitting of retail payment instructions. The Payment Systems Group and commercial bank members co-operated in improving the system based on this approach.

▶ **Improvements in the Cheque Clearing System**

The PSC agreed to allow the Payment Systems Group to participate in the working group on cheque truncation with the Subcommittee on National Payments Co-operation and to commission a consultant to conduct a cost-benefit analysis of development alternatives for improving the cheque clearing system. Initially, it was agreed that signature image technology will be used for provincial cheque clearing, and subsequently for the B/C system.

▶ **Monitoring of Funds Transfer Transactions for BOT Payment Services**

The PSC issued a policy to study cheque usage and cheque return data before and after the economic crisis to serve as a precaution of the economic situation. Also included is data on high-value funds transfers through the BAHTNET system to consider the factors for setting up an alarm system. This is to follow the movement of financial institutions and to monitor any irregularities in the liquidity of the payments system that may affect the economy.

Subcommittee on National Payments Co-operation

1 2



Chairman

Mr. Teera Aphaiwongse
Senior Executive Vice President
Bangkok Bank Public Company Ltd.

Members

1. **Mr. Charamporn Jotikasthira**
Executive Vice President
Siam Commercial Bank Public Company Ltd.
2. **Ms. Supatra Hiranras**
Senior Vice President
Support Functions Department
Krung Thai Bank Public Company Ltd.
3. **Mr. Chet Raktakanishta**
First Executive Vice President
Bank of Ayudhya Public Company Ltd.
4. **Ms. Vilawan Vanadurongvan**
Executive Vice President
Bank of Asia Public Company Ltd.



1.



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3.



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5.

Members

5. **Mr. Suwan Rattakul**
Vice President System Development
Thailand Post Company Ltd.
6. **Ms. Vira-anong E. Chiranakhorn**
Global Transaction Services Head, Thailand
Citibank, N.A.
7. **Mr. Sayan Pariwat**
Senior Director
Payment Systems Group
Bank of Thailand



6.

Member and Secretary

8. **Mr. Pramoth Chaiamphorn**
First Senior Vice President
Kasikornbank Public Company Ltd.
As of December 2003



7.

Duties of the Subcommittee on National Payments Co-operation

(as stipulated under Payment Systems Committee order 1/2545 on establishment of the Subcommittee on National Payments Co-operation on 25 December 2002)



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1. To consider code of conducts in providing payment services and to set technical standards for payments infrastructure in order for common utilization that is efficient, secure, and promotes fair competition.
2. To consider policy approaches in areas as follows:
 - 2.1 Promote the common use of payment systems for efficiency and for reducing duplicate investments.
 - 2.2 Support and initiate modern payment instruments, payment technology, and payment services.
 - 2.3 Promote linkages in both domestic and international payment systems.
 - 2.4 Implement data collection and payment-related research for the benefit of organizations in both public and private sectors.
3. To consider the structure and guidelines in establishing a co-operative organization among payment service providers in order to efficiently undertake the duties and responsibilities from the subcommittee as noted in the two points above.



Work accomplished in 2003

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The Subcommittee on National Payments Co-operation was established by the PSC on 25 December 2002 to enable related parties in the public and private sectors to participate in setting the appropriate payment policy directions.

In 2003 the PSC agreed with the subcommittee's establishment of 7 working groups to study and resolve major problems, including guideline development, and to push forward the implementation of major payment systems as follows.

1. Working Group on Electronic Money

The objective of the working group is to study information related to electronic money, particularly the stored value card or e-purse to replace cash payments in the future.

Implementation

- To study the process of using the stored value card from issuance by the card issuer to use of the stored value card by the card holder.
- To define the scope of duties and responsibilities of all related parties in the process of using the stored value card and to determine the procedures.
- To study various risks, standards and legislative issues related to the stored value card.
- To prepare a summary report on electronic money on smart cards for further consideration by the PSC.



2. Working Group on Barcode Standard

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The objective of the working group is to set a common national barcode standard for use in payment documents to reduce costs and to increase convenience for all related parties.

Implementation

- To study and determine the barcode design that will be announced as the standard and to specify a common location of the barcode on the payment document, including invoices for various utility expenses and credit card statements, and to test the barcode in operation.
- To present the draft barcode standards for consideration by the PSC and to organize meetings to inform organizations and institutions involved, after which the barcode standards is expected to be in use from mid-2004.

3. Working Group on Payments Association Survey

The objective of the working group is to study the structure and approaches for establishing the TPA. The study will cover the organizational structure, objectives, scope of responsibilities, providers to co-operate in the payments system and that relate developments are efficient and safe. With the successful establishment of the TPA, the Subcommittee on National Payments Co-operation will be disbanded.

Implementation

- To present to the PSC research results on alternatives in establishing the TPA. The legal obstacles that may possibly prevent the setting up

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of the TPA were raised. The PSC agreed to allow the Subcommittee on National Payments Co-operation to perform the duties of the TPA while the legal obstacles were being resolved, as the subcommittee consisted of a diverse range of payment service providers, and has objectives and duties similar to that of the TPA. It has also performed duties that have been acceptable.

4. Working Group on SMART

The objective of the working group is to improve the efficiency of SMART, which is an interbank electronic retail payments system. Connections among financial institutions and the public sector are also possible, with both credit funds transfer and debit funds transfer.

Implementation

- Developments in the SMART system will be delayed due to the policy of integrating the system into the ITMX, which is expected to be operational in 2005.
- The working group and the BOT reviewed the fee structure and value limits per transaction, where details will be discussed with the Thai Bankers' Association and the Foreign Bankers' Association in early-2004.

5. Working Group on Cheque Truncation

The objective of the working group is to study the design for cheque truncation and to analyse the operational costs and risks.

Implementation

- To study and determine the design for cheque truncation with the use of Signature Image and Cheque Image.
- To consider alternatives in the operation of signature image and to co-operate with the BOT in implementing the operational procedures.



6. Working Group on ITMX

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The objective of the working group is to establish the ITMX system to serve as the payment infrastructure for interbank retail payments based on the payment gateway. This improves the convenience for interbank payments where Straight Through Processing (STP) reduces duplicate investments in the payments system, along with supporting electronic commerce that is expected to increase in the future.

Implementation

- The standard for exchanging data formats in the ITMX system has been determined, along with the study and design of the investment model, the prototype, and the proof of concept.
- Planned work in the successive stage includes the study and improvement of the design for the remaining parts of the system, the preparation of the request for proposal (RFP), after which the system operator and programmer is expected to be selected during the first half of 2004. Operations are expected to start in 2005.

7. Working Group on International Payment Gateway Survey

The objective of the working group is to conduct a comparative study on payment systems in different countries, particularly on successes and failures, to adapt for use in Thailand.

Implementation

- Completed studies into payment systems in the Philippines and Hong Kong



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1.1 Payments Policy

The Bank of Thailand formulated Payment 2004 as a road map for developing the national payments system for the business sector, banks and related organizations between 2002-2004.

The plan covers five major agendas as follows:

1. The establishment of a co-operative payment systems organization
2. The collection of data on payment systems
3. The drafting of a payment systems law
4. The setting up of payment systems infrastructure and standards
5. The study on cross-border payment systems linkage

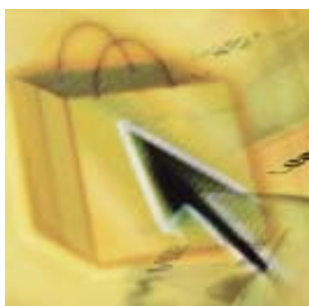
The increased awareness among central banks around the world on the importance of payment systems, particularly systemically important payment systems that may have implications towards the stability of the country's financial institutions and required regulation to ensure security and efficiency, has led the BOT to determine payment systems as another major area under its responsibility in addition to monetary policy and supervision. In 2003 the BOT formulated a five-year strategic direction (2003-2007)¹ to create a framework for achieving a modern payments system that is appropriate, efficient, and fully responsive to user needs. This focuses on the following:

1. To ensure the widespread and appropriate use of various payment means.
2. To promote the creation of interbank payment systems that support electronic commerce transactions to provide convenience and promote trade in the country.

¹ Details of the five-year strategic plan (2003-2007) are available at www.bot.or.th

3. To ensure that payment system security and efficiency meet international standards.
4. To ensure that a payment systems database is up-to-date and supports decision-making.
5. To prepare cross-border payment system development to serve regional trade and investment.

The role of related private sector participation was added in the form of formulating policy and payment directions through the Subcommittee on National Payments Co-operation.



1.2 Infrastructure

1.2.1 Interbank Transaction Management and Exchange (ITMX)

1.2.1.1 Background

Under Payment 2004 A Road Map for Thai Payment Systems, the BOT and the National Electronics and Computer Technology Center (NECTEC) jointly established the Committee on Payment Infrastructure and Standards² that comprised of experts and representatives from related organizations in the public and private sectors. The committee's duty is to set the objectives and guidelines for the project to reduce duplicate investments, to support payment across institutions in current and future payment networks, and to serve the electronic commerce transactions widely.

A majority of electronic payment systems at present serve payment initiators and recipients who have accounts at a common bank or within a

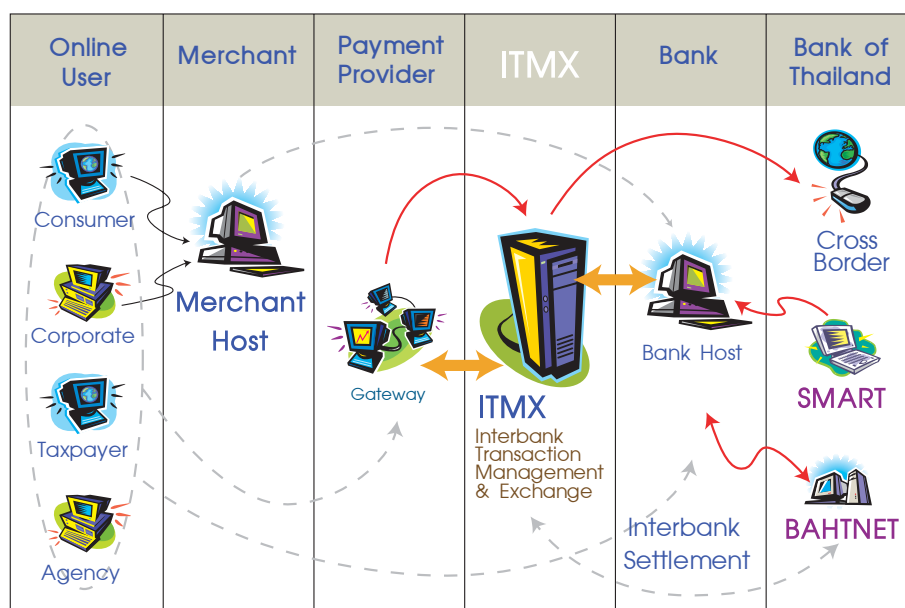
² The Committee on Payment Infrastructure and Standards comprises of 13 institutional representatives from the private and public sectors. The Bank of Thailand and the National Electronics and Computer Technology Center are co-chairs. Developing payment infrastructure and standards forms part of Payment 2004 A Road Map for Thai Payment Systems. See further details at www.bot.or.th

1 Important Developments of Domestic Payment Systems

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group of banks who have membership in a payment system. Funds transfer and payment services across different banks or across non-members are not provided. The aforementioned committee therefore proposed an ITMX conceptual model to serve as the core structure with interoperable standards for the PSC to consider, and was approved for further implementation since 15 October 2002.

Figure 1 : ITMX conceptual model



1.2.1.2 Key Features

- (1) a technical infrastructure which is based on an open platform standard that can be connected with different systems
- (2) standard messaging to facilitate exchange across systems
- (3) business process standards accommodate the need for electronic commerce transactions

- (4) a reliable security system
- (5) supports for both public and private sector payment transactions
- (6) supports cross-border funds transfers in the future

The PSC agreed to allow the Subcommittee on National Payment Co-operation and the Committee on Payment Infrastructure and Standards to jointly consider the procedural details in establishing the company, which will be implementing the ITMX system. The BOT will play a regulatory role to create security confidence among users.



1.2.2 ASEANPay

ASEANPay is a project established under the e-ASEAN Initiatives project. The objective is to develop a cross-border retail payments system infrastructure for the ASEAN region to support the expansion of trade and to strengthen the competitive potential of the region in the world market. The initial implementation plan is divided into two phases. The early phase covers the pilot countries, including Thailand, Singapore, Malaysia and Indonesia. The following phase will cover all countries in the ASEAN region. In 2003 each country established a working group to study the project details, to summarize readiness in implementation, and to plan for the successive phases. The working committee consists of two committees. A steering committee, made up of senior-level central bank executives, is responsible for overall project management and policy implementation. A working committee, comprising of representatives from the central bank and commercial banks, conduct a detailed feasibility study and report the results to the steering committee.

1 Important Developments of Domestic Payment Systems

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1.2.3 Project on Cheque Clearing Efficiency Improvement

Many countries have presently introduced cheque image processing technology to support the development of cheque truncation for interbank cheque clearing.³ This is to reduce costs and the burden of cheque transportation, to speed up the process of cheque collection and return and to support cross-border transactions in the future. For example, Singapore developed the cheque truncation system (CTS), which shortens the cheque transportation of the sending bank by using technology for sending and receiving data and on-line cheque image across bank members and the clearinghouse. The CTS has been in operation since July 2003. Hong Kong has adopted a similar technology in June 2003. In the United States, the Checks Truncation Act was endorsed by Congress and will be enforced from October 2004. Initially, this will be implemented for the cheque return cycle and will be expanded to the cheque collection process accordingly.

The BOT has also continually implemented a project on improving the efficiency of the cheque clearing system, including three interbank cheque clearing systems as follows: the cheque collection system in Bangkok and its vicinity, the provincial cheque collection system, and the inter-district cheque collection system. A seminar was organized in February 2002 to publicize the approaches to commercial banks, including the exchange of views and experiences among member banks in order to jointly determine various

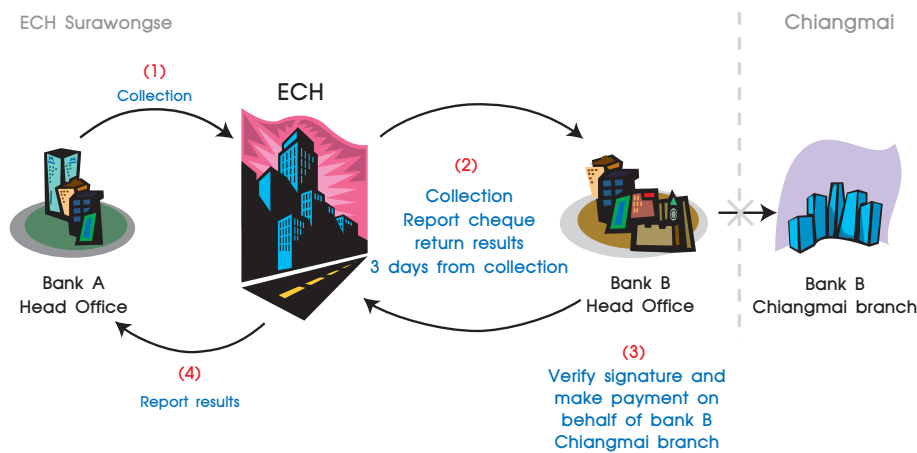


³ Report on Approaches to Shortening Cheque Transportation, Payment Systems Group, Bank of Thailand, January 2002.

development approaches. This covers additional investments by member banks and the clearinghouse for the new system's hardware, software and network bandwidth. Also included is the need for legislation to support the use of images in substitution of actual cheques, the amending of regulations on the responsibility across collecting banks and paying banks, the core standard for converting cheques into images, the standard of images that is acceptable, and the implementation model.

In 2003 the BOT introduced improvements for the inter-district cheque collection system (B/C) at Bangkok clearinghouse by using signature image technology and the use of substitute authorized payments in operations. As all banks were ready, this resulted in inter-district cheque collections ordered by an account holder in the central region being able to be collected at the clearinghouse and knowing of the collection result within three working days (B/C-3D) since 14 February 2003. In quarter three of 2003, this was expanded nationwide. To ensure that overall efficiency improvements in the cheque clearing system proceeded successfully, the PSC agreed that the Subcommittee on National Payment Co-operation and the Bank of Thailand jointly push forward the aforementioned project. The joint working group has selected the use of signature image technology, previously used for B/C-3D, in Bangkok. This is currently under preparatory testing by six pilot banks namely, Bangkok Bank, Kasikornbank, Krung Thai Bank, Siam Commercial Bank, Bank of Asia and Bank of Ayudhya.

FIGURE 2 : CONCEPT OF B/C-3D SYSTEM



1.3 Progress on Drafting Related Legislation ⁴

1.3.1 Electronic Transactions Act B.E. 2544 (2001)

The Electronic Transactions Act of 2001 was promulgated in the Government Gazette on 4 December 2001 and has come into force since 3 April 2002, where electronic data and paper have equivalent legal status, and where the electronic signature law is equivalent to a hand signature. On 23 September 2003, the Cabinet agreed to establish the Electronic Transactions Committee to formulate policy and develop guidelines to promote the acceptance of electronic transactions, and to resolve related problems and obstacles. The commission comprises of the Minister of Information and Communication Technology, who is the chairman of the commission, and 12 appointed experts whom are selected from both the

⁴ See details at www.etcommission.go.th

public and private sectors, including areas such as finance, electronic commerce, law, computer science, science and engineering, and social science. The director of the National Electronics and Computer Technology Center of the National Science and Technology Development Agency serves as a member and secretary to the commission.

The Electronic Transactions Commission

Chairman

Dr. Surapong Suebwonglee

Members

Finance

Mr. Sataporn Jinachitra Public sector representative

Mr. Chartsiri Sophonpanich Private sector representative

Electronic Commerce

Mrs. Saowanee Suwannacheep Public sector representative

Ms. Vilawan Vanadurongvan Private sector representative

Law

Mr. Kampree Kaocharern Public sector representative

Mr. Chavalit Uttasart Private sector representative

Computer Science

Mr. Sahas Treetipbut Public sector representative

Dr. Kanchit Malaivongs Private sector representative

Science or Engineering

Dr. Jaremsri Mitrpanont Public sector representative

Mr. Prayoon Shiowattana Private sector representative

Social Science

Dr. Amat Leemakdej Public sector representative

Mr. Sukont Kanjanahuttakit Private sector representative

Member and Secretary

Dr. Thaweesak Koanantakool

Commission members serve a three-year term with re-appointment not exceeding two consecutive terms.

1 Important Developments of Domestic Payment Systems

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The authorities and duties of the Electronic Transactions Commission according to the Electronic Transactions Act B.E. 2544 (2001) are as follows:

- (1) To make recommendation to the Cabinet to lay down policies for promotion and development of electronic transactions including solving relevant problems and obstacles (Section 37);
- (2) To monitor and supervise the operation of service business relating to electronic transactions;
- (3) To make recommendation or give advice to the Minister (Minister of Information and Communication Technology) to issue four Royal Decrees pursuant to Electronic Transaction Act B.E. 2544 (2001) as follows:
 - Royal Decree under Section 3 determining the type of transaction that are disallowed to use electronic mean
 - Royal Decree under Section 25 determining the security method
 - Royal Decree under Section 32 determining service businesses relating to electronic transactions that require notification, registration, or license
 - Royal Decree under Section 35 determining the criteria and method for electronic transactions by public sector organizations
- (4) To issue rules or notifications relating to electronic signature in compliance with this Act or the Royal Decrees issued pursuant to this Act (Section 37).
- (5) To perform any other act in compliance with this Act or other laws (Section 37).
- (6) To establish subcommittees to consider or implement matters on behalf of the Electronic Transactions Commission (Section 42).



A Subcommittee on Electronic Transactions was established on 15 December 2003 to carry out duties under five areas as follows:

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- (1) To work on policy and planning to make recommendation on formulating policy and measures in promoting electronic commerce and creating confidence for the public by proposing measures to solve various existing problems and obstacles.
- (2) To work on regulation to have authority to make recommendation on the type of service business for the private sector or public sector electronic transactions that should be regulated. Also included is advice on regulatory measures and risk assessment before and after supervision to create confidence in electronic commerce.
- (3) To work on legal infrastructure legislation to have authority to make recommendation on issuing Royal Decrees and various rules, along with policy and operational approaches stipulated in the law or various regulations. This is to serve as operational advice for private sector businesses, the public sector or the public, which shall support recommendation on measures to solve various problems and obstacles.
- (4) To promote and support the application of information and communications technology. To work on ICT application for e-business to have authority to make recommendation on formulating various standards that support ICT for e-business and public sector electronic knowledge and understanding or the studying of electronic commerce, or related areas, for the benefit of large, medium and small businesses, along with the public sector and the public.
- (5) To work on security to have authority to make recommendation on formulating measures or policy on security, to support the work of other subcommittees, to prepare plans or measures in developing security personnel, along with to prepare plans on creating awareness on security for parties conducting electronic transactions.

1 Important Developments of Domestic Payment Systems

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The BOT is involved in issuing Royal Decrees under every subcommittee, particularly the Subcommittee on Supervising Private Sector Electronic Business Services and Public Sector Electronic Transactions. The initial scope covers electronic payment services and electronic certification services. A Subcommittee on Legislation pushes forward the issuing of Royal Decrees and the enforcement procedures accordingly.

1.3.2 Electronic Funds Transfer Law

On 15 December 1998, the Cabinet endorsed the National Information Technology Committee's project on developing information technology laws according to measures to reform information technology laws, which is an important part of the national information technology plan (IT 2000). IT 2000 is aimed at developing society and strengthening industrial and international trade businesses for the new economy in the 21st century. The National Information Technology Committee had drafted six related laws as follows:

1. Electronic Data Interchange Law
2. Electronic Signatures Law
3. National Information Infrastructure Law (originally a secondary law of the constitution under section 78)
4. Data Protection Law
5. Computer Crime Law
6. Electronic Funds Transfer Law



The Cabinet delegated the subcommittee and secretariat duties to the National Electronics and Computer Technology Center under the Ministry of Science and Technology.

Currently, the Electronic Data Interchange Law and Electronic Signatures Law were combined and enforced under the Electronic Transactions Act of 2001 (See section 1.3.1). Drafting of the Electronic Funds Transfer Law and the three remaining information technology laws (National Information Infrastructure Law, Data Protection Law, and Computer Crime Law) have been moved under the responsibility of the Ministry of Information and Communication Technology due to restructuring of ministries in late-2003.

Prior to the above changes, the National Electronics and Computer Technology Center issued an order (order 41.2/2546) on 27 March 2003 to establish a working group to study issues and problems in electronic funds transfer. As result of comparing Thai and international laws related to electronic funds transfers, the working group agreed to draft this law, which would determine the rights and responsibilities of various parties involved in the electronic transfer of funds, including new payment means.

1 Important Developments of Domestic Payment Systems

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1.4 New Payment Services

1.4.1 Postal Banking

The privatization policy of state enterprises to improve efficiency similarly to the private sector since 8 July 2003 and the Cabinet's resolution to privatize the Communications Authority of Thailand (CAT) according to the telecommunications master plan and the State Enterprise Fund Act of 1999 led to the division of CAT into two companies. This includes Thailand Post Company Limited and CAT Telecom Public Company Limited that were registered on since 14 August 2003. Thailand Post remained a state enterprise under the Ministry of Information and Communication Technology, with reforms to its image, service improvements, and business-oriented services. Its advantage includes a network of 1,148 branches that cover a broad area, particularly for provincial customers, and the increase in fee income ratio from goods and services payments through Pay at Post when compared to mail and parcel delivery services, and postal money orders.

Thailand Post expanded its business into postal banking after receiving authorization from the BOT on 5 November 2003 to be the representative for commercial banks in cash deposits to and withdrawals from existing saving accounts. Other services include funds transfer to third party saving accounts, and document delivery and receipt between customers and commercial banks where the post office is a representative. Account opening and lending are not yet available. Commercial banks that have signed an agreement allowing the post office to act as their representative are Siam Commercial Bank and the Bank of Asia, as of early-2004.



1.4.2 Mobile Payment

Since October 2003 mobile payment and funds transfers for goods, utility payments, loan payments started to increase with increased awareness as a result of co-operation between the Mobile Payment Club (MPC)⁵, commercial banks, mobile phone operators, and various shops. Customers holding accounts with the Bank of Asia, Krung Thai Bank, and Kasikornbank are required to register for using the service and notify the account number and mobile phone number, together with setting the four digit PIN code through the Internet banking system.

The design of the service is based on the principle of short message service (SMS) in carrying out transactions, and the call-back IVR system for checking the identification number of the customer. Customers receive convenient and speedy services at every location and time under a highly secured system set-up by banks, while charges are calculated based on the customer's use of SMS services each time a payment is made.

In the initial phase the MPC has started to provide services in co-operation with two mobile phone companies, including AIS and DTAC, and will be expanded into other systems within late-2004. Shops providing payment services through the MPC in the initial phase include EGV, Thai Ticket Master, TV Direct, Miss Lily, and INET, etc.

⁵ See further details at www.mobilepaymentclub.net

2 Important Developments of International Payment Systems

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2.1 The Committee on Payment and Settlement Systems (CPSS)

In addition to the supervision of core payment systems or high value funds transfer system which is systemically important payment systems to ensure efficiency and safety, many central banks have increased their attention on supervising retail payment systems to create consumer confidence and to support local and international trade.

In 2003 the Committee on Payment and Settlement Systems (CPSS)⁶ published a report on Policy Issues for Central Banks in Retail Payments. This study collected, analysed and compared data on payment means and retail settlement systems of member countries and Australia published between 1999-2000.

The above report has been beneficial in reviewing the role of the central bank and formulating policy that would require adjustments to new technology and various changes in business strategies that differ across countries. Nevertheless, preliminary guidelines that could be used as common objectives have been proposed in four areas as follows:

⁶ The CPSS is a forum for the group of central banks in 10 European countries whose responsibility is to conduct studies on the situation and developments in domestic payment systems to ensure the efficiency and safety of payment systems. The Bank for International Settlements serves as the secretary to the committee. See further details at <http://www.bis.org> under the heading publications.

1. Laws and regulations to support the development and introduction of new systems or payment means
2. The promotion of competition in the market
3. Support for infrastructure development and the establishment of common standards
4. Efficiency in retail payment systems serviced by the central bank



2.2 United States

A study on cheque usage and electronic payments in the United States by the Federal Reserve Board in 2001 found that the use of cheques was as high as 42.5 billion items, while the number of electronic payment transactions was around 30 billion items. Although the proportion of cheque usage to non-cash retail payment means declined from 85.7 percent in 1979 to 59.2 percent in 2000, they remain the major payment method that is widely popular, particularly for the retail sector and businesses. The Federal Reserve Board proposed the drafting of the Check Truncation Act (CTA) in 2001 to support the use of technology to speed up and increase efficiency in the cheque collection system. The law is specific to cheque truncation and aims to support the sending of cheques electronically with consideration by the U.S. Congress and approval by the President on 28 October 2003, and will come into force from 28 October 2004. As a result, substitute cheques, which are captured electronic images of the original cheque and cheques that are created electronically, will have the legal equivalent of original cheques.

2 Important Developments of International Payment Systems

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2.3 European Union

The European Central Bank (ECB) was established on 1 June 1998 to oversee price stability of 15 member countries in Europe, including France, Germany, Italy, Netherlands, Belgium, Luxembourg, Denmark, Ireland, United Kingdom, Greece, Spain, Portugal, Austria, Finland and Sweden. The ECB published a Report on Electronic Money in the same year to serve as a general policy guideline and preliminary requirements in developing electronic money services. The report also serves as an initial guideline for regulating electronic money among member countries.

On 23 November 2003, the ECB published a follow-up report on the Electronic Money System Security Objectives (EMSSO). This report focused on the technical security standards of electronic money that countries may adopt to ensure system integrity, to use as a regulatory guideline under different conditions, and to serve as a guideline to support the linkage of different electronic money systems.





2.4 United Kingdom

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Due to the issuing of smart cards with different standards by different organizations in England and Scotland, the United Kingdom government therefore planned to establish a common standard for smart cards. This involved obtaining opinions from related parties and preparing a paper on 'Smart Cards: Enabling e-Government'⁷ to present the vision of the public sector on smart cards for the general public, and to analyse the problems and obstacles in its development. The Office of the e-Envoy, who prepared the paper, is responsible for pursuing the change of all government services towards electronic services by 2005. The Office of the e-Envoy considers smart cards as playing an important role in promoting e-Government locally and nationally, with everyone being able to gain access to various e-Government services through a card reader connected to a digital television or a computer in the future. The problem, however, is the lack of a common standard for interoperability, the lack of a business case that proves its multi-purpose functions, and the need for authenticity between the card user and owner. A solution to this problem is having technology standards that will reduce the costs of smart cards, whereby back office management programs can be shared or the use of a single card with multi-purpose functions. This would involve related parties in both sellers and service providers adopting the e-Government Interoperability Framework (e-Gif), which are general standards for computer systems under the e-Government project.

⁷ See further details at www.e-envoy.gov.uk

2 2 Important Developments of International Payment Systems

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2.5 Australia

An important regulatory role for the Australian central bank in 2003 involved changes in the operational method of credit cards. These changes started since 2000 as a result of concerns that the Payments System Board and the Australian Competition and Consumer Commission had on the impact of interchange fees on cardholders and merchants. Bankcards from Master Card and Visa Card in Australia were regulated under the Payment Systems (Regulation) Act of 1998 in April 2001. The Standard on Merchant Pricing measure, effective from 1 January 2003, removed past limitations set by international credit cards that gave merchants independence in fee setting or charging for additional services, and the authority in negotiating fee reductions for merchants in providing credit card services. The Standard on Interchange Fees, effective from 1 July 2003, requires cost-based principles in setting the ceiling for interchange fees. If used, this would help reduce the per item cost of credit cards from 0.95 percent to 0.55-0.6 percent or around US\$ 400 million per year. In addition, non-financial institutions were permitted to compete under the supervision of the Australian Prudential Regulation Authority (APRA).





2.6 Singapore

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The Monetary Authority of Singapore (MAS) has given importance towards regulating payment systems to ensure safety and efficiency to create stability for the financial system and financial institutions in the country. Use of the financial institution law and the co-ordination principle, which were not applicable to non-financial institutions, led to the need in drafting an explicit Payment Systems Oversight Act. This Act gives power to the MAS in two major areas, including the authority to collect data from related parties in the payments system for the purpose of monitoring and control, and the authority to supervise Systemically Important Payment Systems (SIPS) and System-Wide Important Payment Systems (SWIPS), which are considered as an important payment infrastructure for the country's financial market. The MAS designated the MAS Electronic Payment System (MEPS), a high-value funds transfer system, as a SIPS, and the cheque settlement system and other ACH systems (Interbank GIRO Clearing System) as SWIPS in its preliminary assessment. The Act would initially take effect on the cheque settlement system and the Interbank GIRO Clearing Systems. The MEPS, which is owned and operated by the MAS, will be based on making operational improvements to the system in meeting the established standards instead. For EFTPOS systems, credit card networks, and ATM networks, the MAS will rely on data collection to understand the systems and their implications prior to setting supervisory rules.

2 2 Important Developments of International Payment Systems

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Multi-purpose stored value cards (MPSVC), such as the cash card and the ez-link card, will be under the supervisory rules on multi-purpose stored value cards of the financial institutions law, which has not been come into force.

The MAS published a consultation paper on the Payment Systems Oversight Act on 16 April 2003 to obtain comments and recommendations from related organizations, and will be drafting the legislation to obtain comments from the general public accordingly.



2.7 Malaysia

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Malaysia is another country that has given importance for issuing an explicit legislation on the oversight of the payment system. The Payment Systems Act of 2003, which came into force on 1 November 2003, covers both payment service providers and providers of various payment means. Payment service providers are required to submit related documentation to the central bank for consideration prior to starting services. This differs from the original law requiring prior authorization from the central bank. Providers of various payment means are still required to seek authorization from the central bank. The Act also gives authority to the central bank on supervising important payment systems, including governance and the appointment of senior management that will ensure business continuity. Payment systems and payment means that have been authorized under the Banking and Financial Institutions Act of 1989 are treated as authorized services under the Payment Systems Act of 2003.

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Payment System Statistics ⁸

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The PSC has monitored various data and key statistics in the payments system in formulating the payment policy framework and direction, along with following developments in the country's financial system to ensure efficiency, safety, and fair competition. In addition, cross-country comparisons have been made to determine benchmarks for developing payment means, and also for retail and wholesale payment systems accordingly.

3.1 Payment Infrastructure Developments

3.1.1 Branches of Commercial Banks, Specialized Financial Institutions and Post Office

FIGURE 3 : NUMBER OF BRANCHES OF COMMERCIAL BANKS, SPECIALIZED FINANCIAL INSTITUTIONS AND POST OFFICES



Source : Bank of Thailand

⁸ See further details in the statistical tables section.

At present, consumers can use payment services through the branches of financial institutions or carry out transactions themselves through various electronic banking service channels. The private sector also provides counter services, such as the Pay at Post service of Post Offices and counter services of the 7-Eleven convenience stores.

In 2003 Thai commercial banks and specialized financial institutions expanded branches to serve increased demand, particularly the latter group which include the Small and Medium Enterprise Development Bank of Thailand (changed from the Small Industrial Finance Corporation since 19 December 2002 with 64 branches), the Islamic Bank of Thailand (established under the Islamic Bank of Thailand Act since October 2002 with 6 branches). In 2003 there were 6 specialized financial institutions (banks only) with a total of 1,268 branches. Thai commercial bank branches increased from 3,650 branches in 2002 to 3,730 branches in 2003. Foreign commercial bank branches were unchanged at 18 branches as in 2001. Thus, the total number of commercial bank branches was 3,748 branches. The number of branches of Thailand Post remained the same following the closure of unnecessary branches from 1,170 to 1,148 branches since 2002. Modernization were made to post office branches, including efficiency enhancement to work procedures and the offering of new services through the existing branches.

Table 1 compares the number of commercial bank and post office branches per one million inhabitants in selected countries. It shows Thailand having a relatively low ratio in 2001 and 2003, which partly explains the long queues of customers in both commercial bank and post office branches.

3 Payment System Statistics

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Table 1 : Number of commercial bank and post office branches in selected countries, 2001

Country	Number of post office branches per one million inhabitants	Number of commercial bank branches per one million inhabitants
Belgium	560	131
Canada	286	nap.
France	428	186
Germany	641	nap.
Hong Kong	219	nap.
Italy	503	237
Japan	304	190
Netherlands	219	140
Singapore	151	nap.
Sweden	229	152
Switzerland	388	438
United Kingdom	245	292
United States	273	nap.
Average^o	349	215
Thailand	78	19
Thailand (2003)	79	18

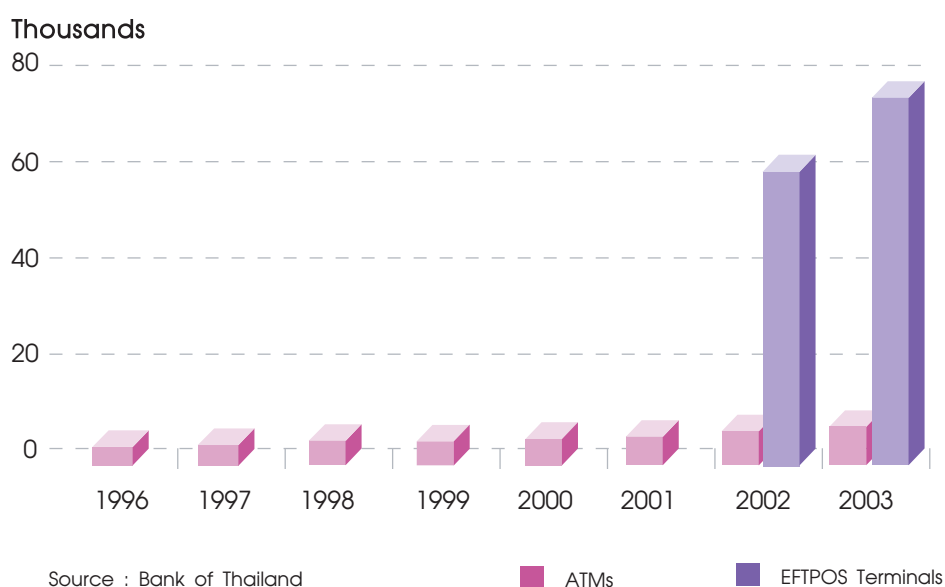
Source : CPSS-Red Book Statistical Update, April 2003

Note : nap. data is not applicable

^o Average excludes Thailand.

3.1.2 ATMs and EFTPOS Terminals

FIGURE 4 : NUMBER OF ATMs AND EFTPOS TERMINALS



ATMs and EFTPOS terminals are the most popular payment service channels for retail customers. Figure 4 shows the number of commercial bank ATM terminals in 2003 was at 9,118 terminals increasing by 16 percent. Survey data from the BOT found that the number of EFTPOS terminals used for goods and services payments with debit cards and credit cards in 2003 totaled 76,000 increasing by 20 percent from 2002.

Table 2 shows the number of ATMs per one million inhabitants as 125 to 145 machines between 2002-2003, and the number of EFTPOS terminals per one million inhabitants as 968 to 1,211 terminals in 2002-2003, respectively. This ratio is relatively low when compared to other countries in Figure 5 and 6, which show the average number of ATMs per one million inhabitants in 2001 as 875 machines, and the number of EFTPOS terminals per one million inhabitants in 2001 as 11,951 terminals.

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Table 2 : Number of ATMs and EFTPOS terminals

	2002	2003
Number of ATMs (machines)	7,885	9,118
Number of ATMs per one million inhabitants (machines)	125	145
Number of EFTPOS terminals (terminals)	61,000	76,000
Number of EFTPOS terminals per one million inhabitants (terminals)	968	1,211

Source : Bank of Thailand

Figure 5 : Number of ATMs per one million inhabitants in 2001

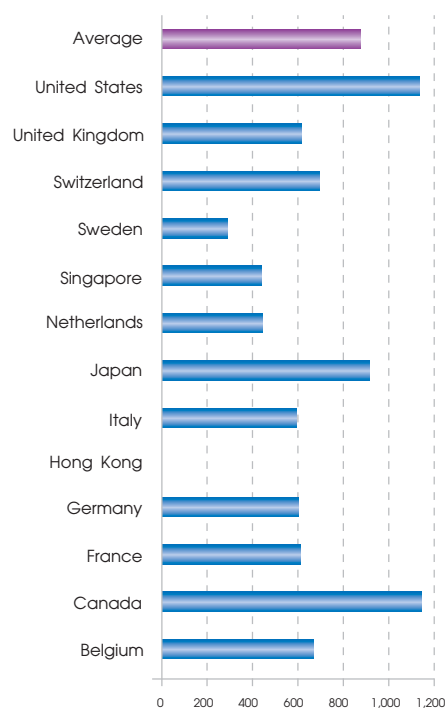
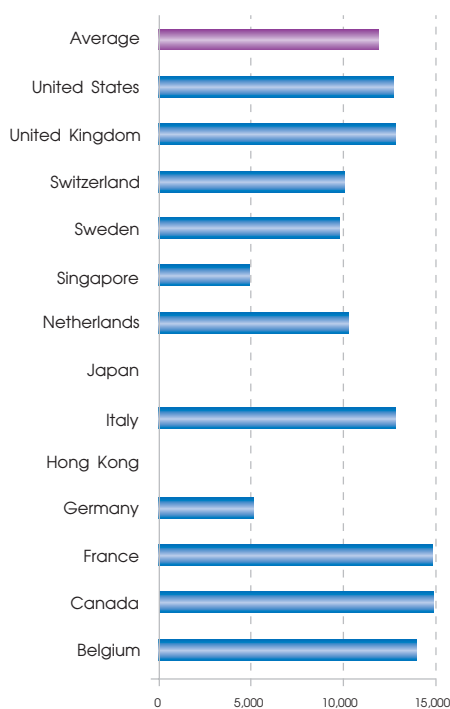


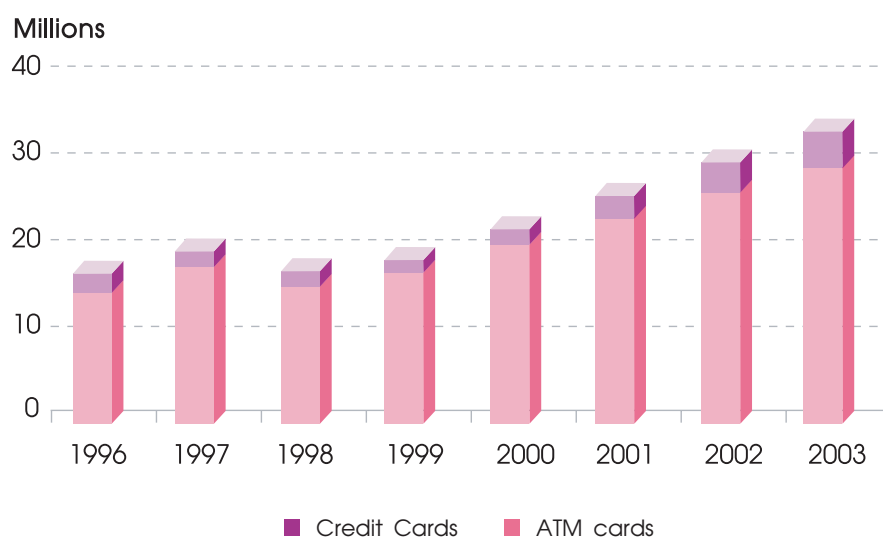
Figure 6 : Number of EFTPOS terminals per one million inhabitants in 2001



Source : CPSS Red Book statistical update, April 2003

3.1.3 ATM and Credit Cards

FIGURE 3 : NUMBER OF ATM CARDS AND CREDIT CARDS



Source : Bank of Thailand

Plastic cards are the most popular retail payment means, including ATM cards, debit cards, and credit cards.¹⁰ In 2003 the number of ATM cards totaled 29.6 million cards, increasing by 11 percent, while the number of credit cards¹¹ issued by financial institutions totaled 4.2 million cards, increasing by 23 percent. A majority of credit cards, or around 92 percent, are issued by Thai commercial banks and foreign commercial bank branches in co-operation with other companies, particularly Visa Card and Master Card. The remaining 8 percent were credit cards issued by Thai commercial banks.

¹⁰ Data on debit cards is available from 2003.

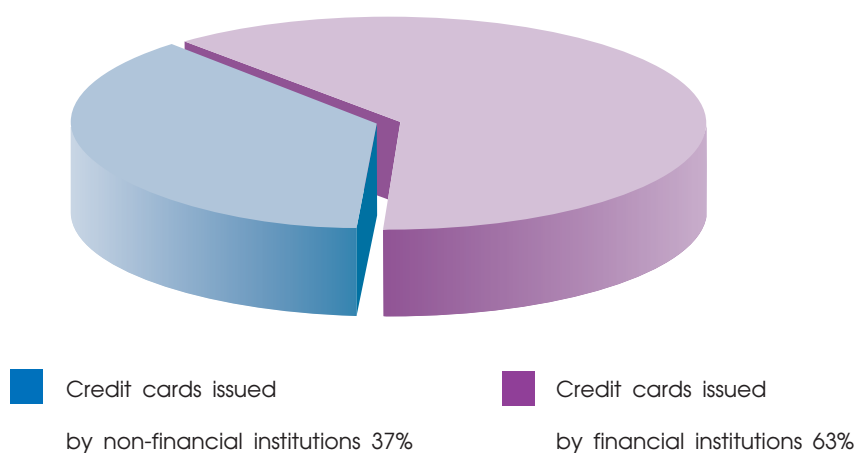
¹¹ Credit card data is from financial institution businesses, and credit cards from Krung Thai Bank and Bank of Ayudhya.

3 Payment System Statistics

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In 2003 the number of credit cards issued by non-financial institutions¹² totaled 2.5 million cards or 37 percent of the total number of credit cards issued, as shown in Figure 8. This brings the total number of credit cards issued in the country to 6.7 million cards.

FIGURE 8 : RATIO OF CREDIT CARDS ISSUES BY FINANCIAL AND NON-FINANCIAL INSTITUTIONS

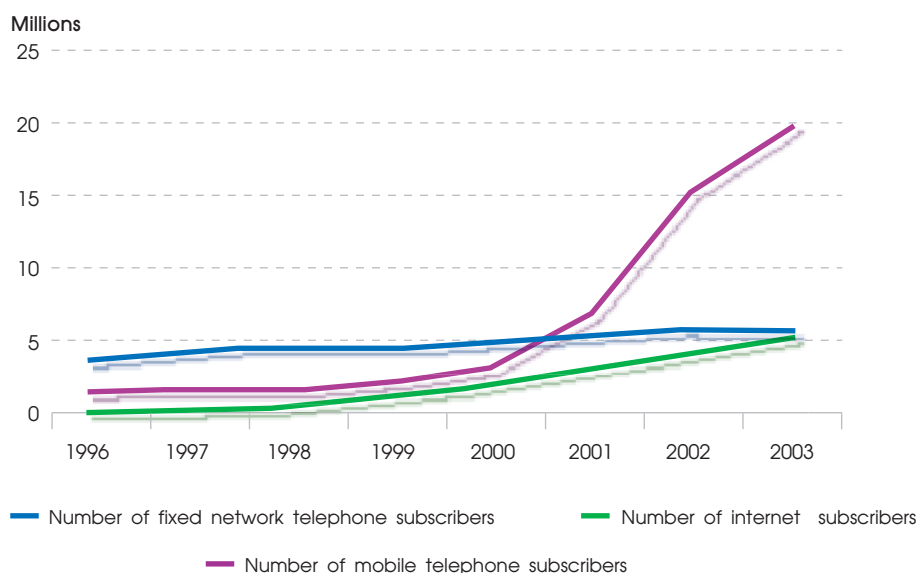


Source : Bank of Thailand

¹² Credit cards issued by non-financial institutions include the following: General Card Services, Cetelem (Thailand), Diners Club (Thailand), Tesco Card Services, American Express (Thai), Aeon Thanasilp (Thailand), and AIG Card (Thailand).

3.1.4 Subscribers of Fixed Network Telephone, Mobile Telephone and Internet

FIGURE 9 : NUMBER OF SUBSCRIBERS OF FIXED NETWORK TELEPHONE, MOBILE TELEPHONE AND INTERNET



Source : Bank of Thailand

Electronic banking services provide consumers another choice in initiating their own payment transactions. This is made possible through telephone banking, Internet banking, and mobile payments, which has increased in popularity in 2003.

In 2003 the number of mobile telephone subscribers continued to increase significantly, as compared to the small growth in fixed network telephones of only 1 percent or an increase to 6.61 million from 6.56 million subscribers in 2002. Mobile telephone subscribers grew from 17.41 million in 2002 to 22.38 million subscribers in 2003 or 36 percent of the population. This largely stemmed from the increase of subscribers of the prepaid system, which totaled 18.03 million, increasing from 12.9 million subscribers in 2002. Subscribers to the postpaid system declined from 4.51 million in 2002 to 4.35 million subscribers in 2003.

3 Payment System Statistics

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The number of Internet subscribers expanded continuously. There are around 6.03 million Internet subscribers in Thailand or 10 percent of the population, according to a survey of Internet users by the National Electronics and Computer Technology Center. This ratio is close to the number of subscribers to the fixed network telephone. The age of the largest user group, with the highest proportion of 47.8 percent, ranged from 20 to 29 years. This is followed by the age group of 30 years and above, and the age group of 20 years and below, with the proportion of 30.4 percent and 21.8 percent, respectively. The survey also found that subscribers remain highly concentrated in Bangkok metropolitan and its vicinity areas at 54.3 percent, while the purpose of use is mainly for information searching and electronic mail, which was 31.9 percent and 31.6 percent, respectively.

3.2 Cash Usage

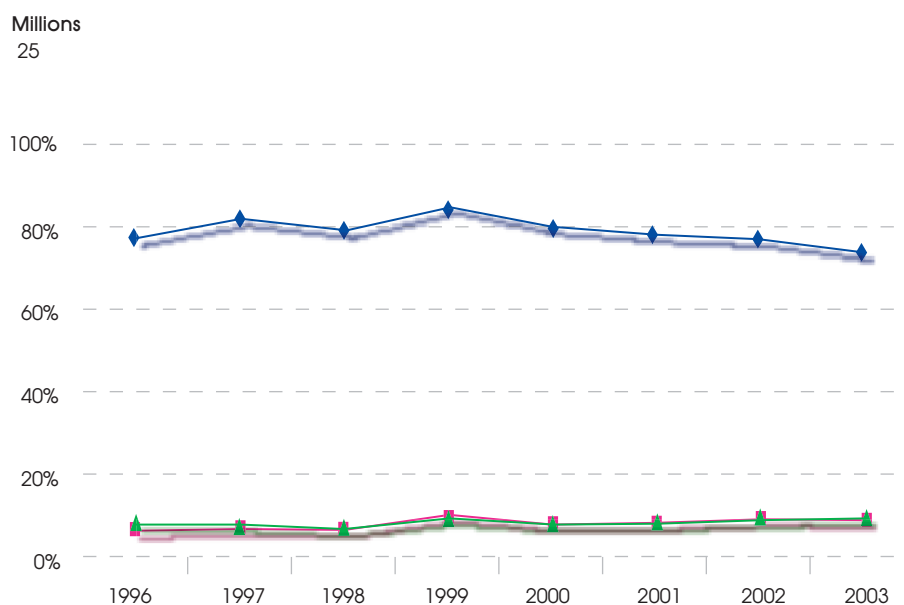
The volume of cash used in the country continued to have an increasing trend although there is a lack of data on the total value of cash transactions. Table 3 shows the currency in circulation per capita at year-end, which shows a continued increase from 2001 onwards, despite the decline in 2000 from 1999 due to preparations for the Y2K crisis.

Table 3 : Currency in circulation per capita

	1999	2000	2001	2002	2003
Currency in circulation per capita (baht)	7,559	6,493	7,004	7,807	8,587

Source: Bank of Thailand

FIGURE 10 : CASH TO GDP, M1 AND M2



Source : Bank of Thailand



3 Payment System Statistics

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FIGURE 11 : COMPOSITION OF CURRENCY HOLDINGS

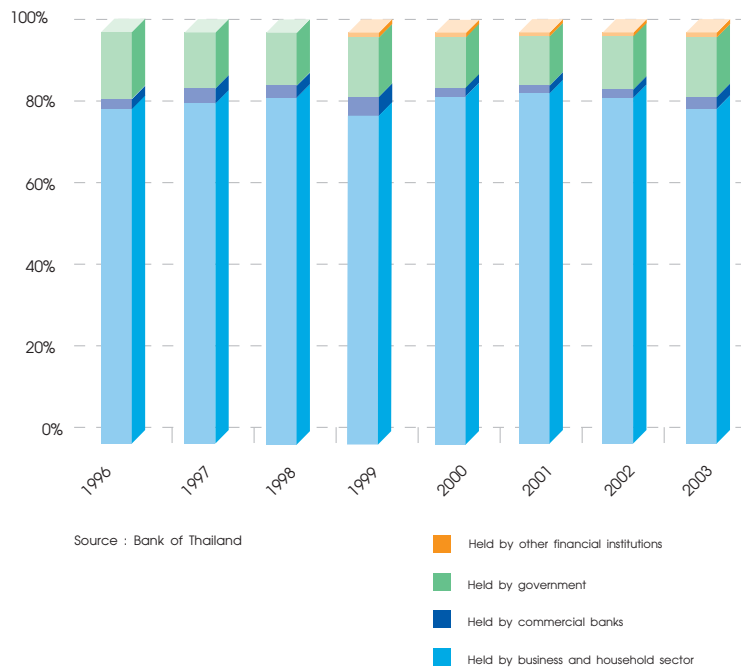


FIGURE 12 : COMPOSITION OF DEMAND DEPOSITS HOLDINGS

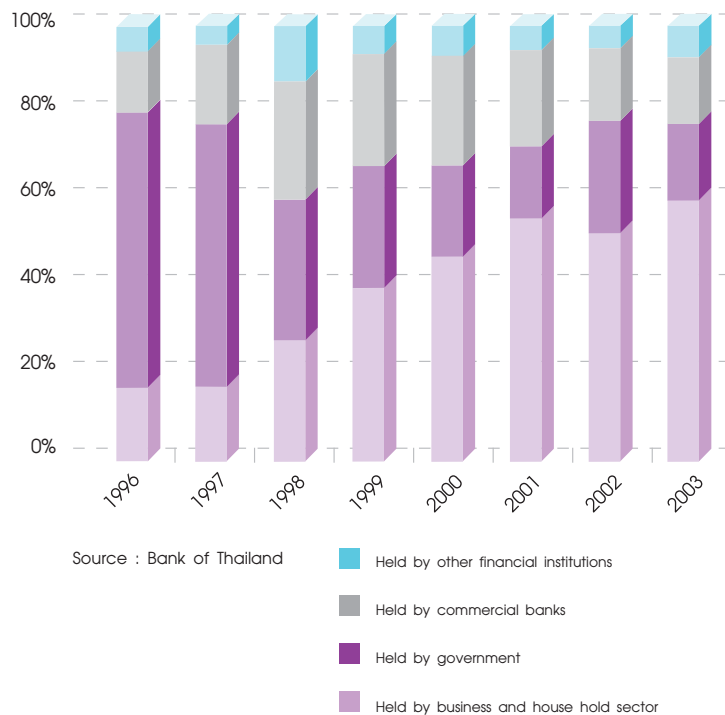


Figure 10 shows that the ratio of currency in circulation to Gross Domestic Product (GDP) at current prices in 2003 was stable at 9.1 percent and unchanged from 2002. When compared to the money supply¹³, the ratio of currency in circulation held by the public¹⁴ declined whereas the ratio of currency in circulation held by the government and commercial banks increased (Figure 11).

Figure 10 also shows the trend in cash usage compare to the use of other payment means through commercial bank demand deposit accounts. This is measured by the ratio of currency in circulation to M1.¹⁵ The trend clearly shows an increase in the use of other payment means since 2000, which is indicated by the rise in the proportion of demand deposits held by the public along with economic recovery since 1998 (Figure 12).

Table 4 compares the quantity of cash in Thailand to other countries. It shows that cash is highly popular with a cash-to-GDP at 9.1 percent. Comparisons of cash usage to other means of payments, based on cash-to-M1, indicates a relatively high ratio for Thailand at more than 70 percent. This shows that although there has been an increase in the use of other payment means, it is still necessary to promote the use of non-cash payment means by the public and the private sector to improve the overall efficiency of the country's payments system.

¹³ Money supply is defined as currency held by the government, commercial banks, public, businesses, households, and other financial institutions.

¹⁴ Currency held by the public is defined as currency held by business and household sector.

¹⁵ M1 is defined as currency in circulation held by the public and demand deposits of businesses and households in the commercial banking system.

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Table 4 : Cash to GDP and M1 in selected countries, 2001

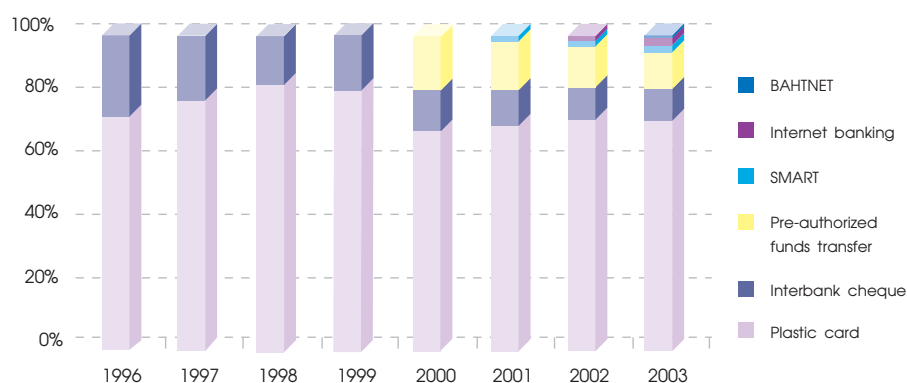
Country	Ratio of Cash-to-GDP	Ratio of Cash-to-M1
Belgium	2.8	11.8
Canada	3.5	13.0
France	2.0	7.4
Germany	3.3	11.3
Hong Kong	7.9	44.2
Italy	4.7	11.3
Japan	13.1	23.7
Netherlands	2.1	5.7
Singapore	7.7	32.9
Sweden	4.5	nav.
Switzerland	8.7	16.7
United Kingdom	3.3	5.0
United States	5.8	48.6
Thailand (2001)	8.5	77.5
Thailand (2003)	9.1	73.2

Source: CPSS-Red Book Statistical Update, April 2003

3.3 Non-Cash Payment Means

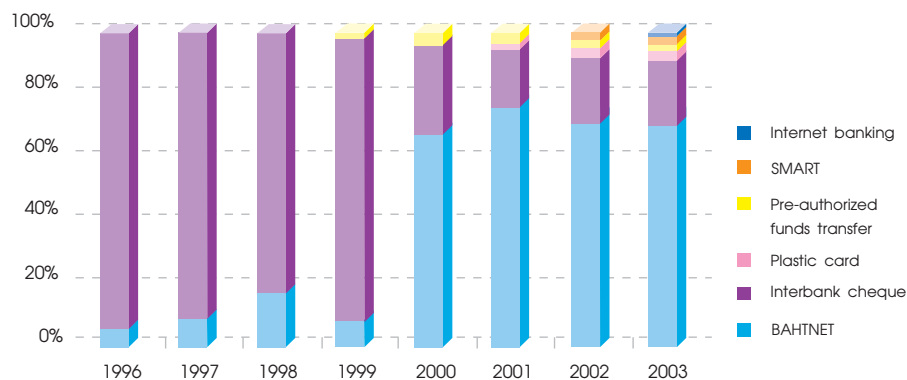
Although cash usage remains relatively high, there has also been a continued growth in other payment means or payment systems. Major payment systems in the country include the following: BAHTNET and retail payment systems, which include the interbank cheque clearing system, commercial bank pre-authorized funds transfer systems, the interbank retail payments system (SMART), plastic cards, and Internet banking.

FIGURE 13 : PERCENTAGE OF TRANSACTION VOLUME OF VARIOUS PAYMENT INSTRUMENT :



Source : Bank of Thailand

FIGURE 14 : PERCENTAGE OF TRANSACTION VALUE OF VARIOUS PAYMENT INSTRUMENT :



Source : Bank of Thailand

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Figure 13 shows the popularity of plastic cards in carrying out various types of payment transactions, particularly for retail customers. Volume of usage has continuously increased in substitution of other payment means, with the ratio of plastic card usage to transactions increasing by 75 percent in 2003. The volume of interbank cheque usage and the volume of pre-authorized funds transfer, although also growing owing to economic growth, had comparatively lower usage ratios to total payment means.

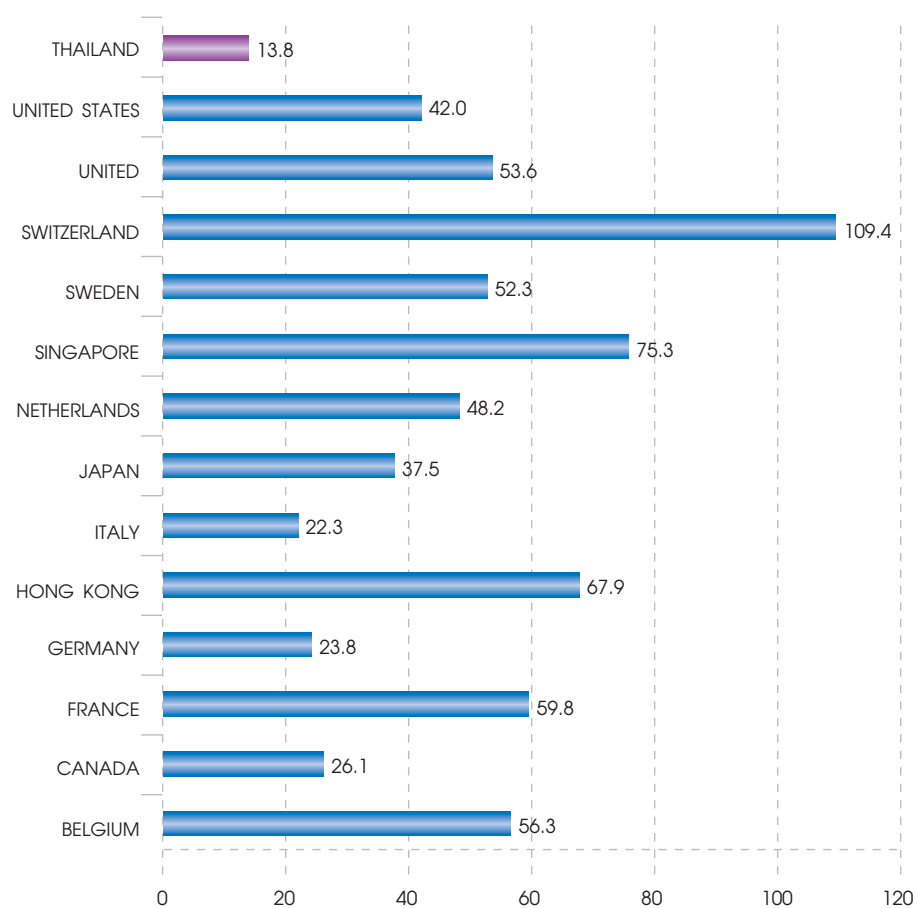
Figure 14 shows the ratio for value of transactions for various payment means in 2003, with constant proportions when compared to 2002. BAHTNET, which is a high-value funds transfer system, remains the highest ratio for value of transactions or 73 percent. The ratio for interbank cheque settlement system was 20 percent, while the ratio for plastic cards and commercial bank pre-authorized funds transfer were constant at around 3 percent.

3.3.1 High-value funds transfer system (BAHTNET)

The high-value funds transfer system, or BAHTNET, was first developed in 1995 to serve as the country's financial market development and to increase efficiency, reduce costs and risks in high-value funds and securities transfers. This is based on an on-line real time gross settlement system with transfer of instructions between members by the SWIFT (Society for Worldwide Financial Telecommunication) network. The Delivery versus Payment (DVP) service was also added to support securities market development in the country. This system commenced operation on 11 December 2001.

Figure 15 shows the daily average volume of transactions in 2003 at 3,904 transactions or around B316 billion per day. The total value of transactions in 2003 was B78,140 billion or around 13.2 times the value of GDP. This is comparatively lower than other major countries, which may be explained by the size of the financial market and transactions by financial sectors in our country.

FIGURE 15 : PROPORTION OF HIGH-VALUE FUNDS TRANSFER TO GDP IN 2001



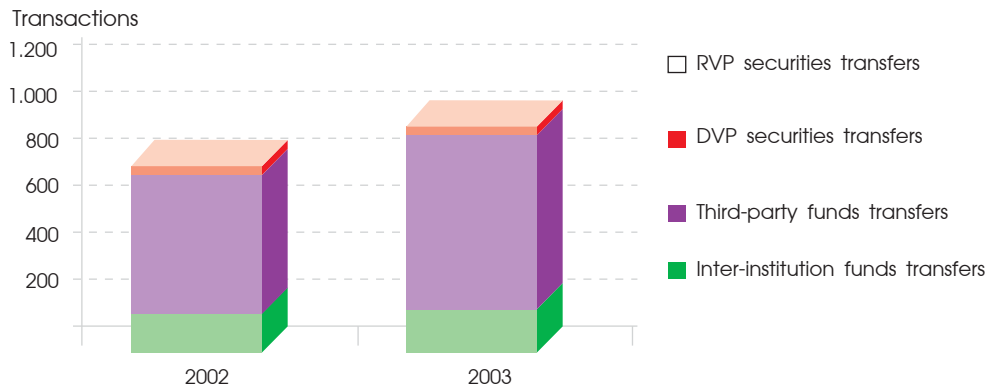
Source : CPSS--Red BOOK Statistical Update, April 2003

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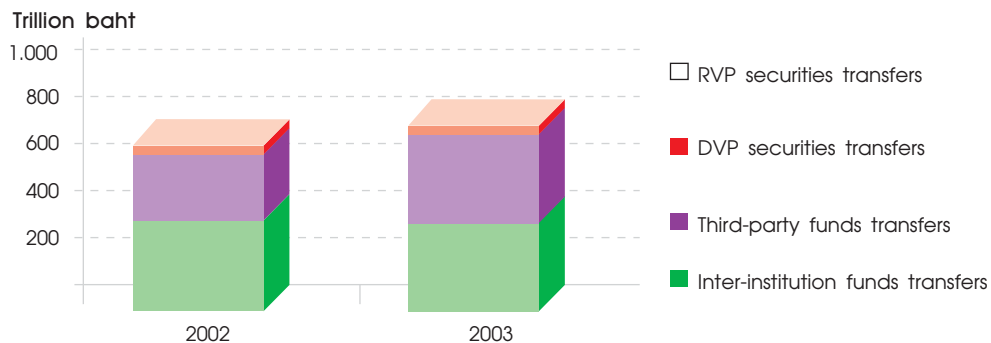
In 2003 the volume and value of funds and securities transfers through BAHTNET grew by 3 times of the growth rate in 2002. This was mainly from the increase of third-party funds transfers originating from non-residents (NR). This led to the high ratio for the volume and value of third-party funds transfers in 2003, which was 78 percent and 49 percent of total transaction volume and total transaction value, respectively (Figures 16-17),

FIGURE 16 : VOLUME OF TRANSACTIONS IN BAHTNET BY TYPE



Source : Bank of Thailand

FIGURE 17 : VALUE OF TRANSACTIONS IN BAHTNET BY TYPE



Source : Bank of Thailand

As BAHTNET is a high-value funds transfer system for financial institutions and various organizations holding accounts with the BOT, and serving as the settlement system for SMART and the interbank cheque clearing system, the Working Group on ROSCs on Payment Systems¹⁶ agreed to determine BAHTNET as a systemically important payment system that is subject to assessment by the International Monetary Funds (IMF) and the World Bank, which will be under revision from September 2003 to early-2006. This assessment would help in formulating policy to promote efficiency in the payment system along with serving as information for investors making international comparisons.

3.3.2 Interbank Cheque Clearing

The interbank cheque clearing system comprises of the interbank cheque clearing system for Bangkok and its vicinity (ECS), the provincial cheque clearing system, and the inter-district cheque clearing system (B/C).

¹⁶ The Reports on the Observance of Standards and Codes is an assessment of a country in various areas based on international standards. This is under the responsibility of the IMF, the World Bank, and various experts from central banks and international organizations. The programme started since 1999 and covers 12 areas as follows: 1. Data Dissemination, 2. Fiscal Transparency, 3. Monetary and Financial Policy, 4. Banking Supervision, 5. Insurance, 6. Securities Market, 7. Payment Systems, 8. Anti-money Laundering, 9. Corporate Governance, 10. Accounting, 11. Auditing and 12. Insolvency.

FIGURE 18 : VALUE OF INTERBANK CHEQU

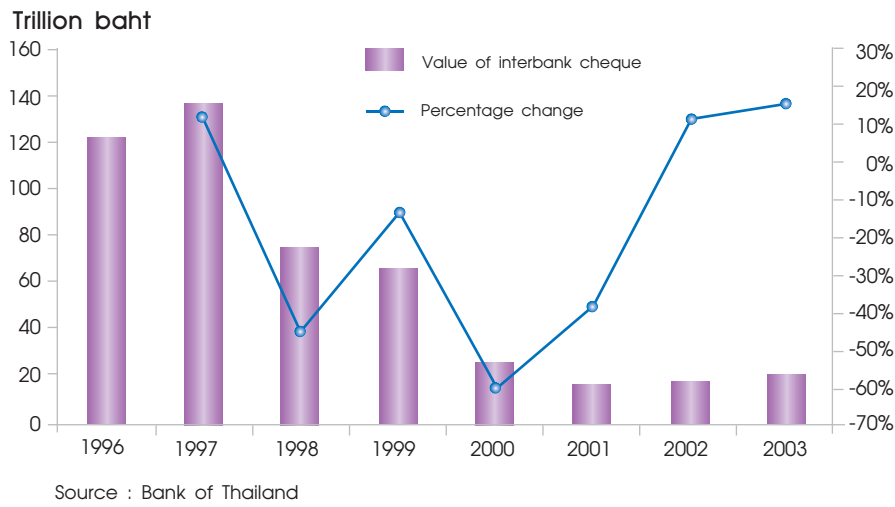


FIGURE 19 : VOLUME OF INTERBANK CHEQUE TRANSACTIONS

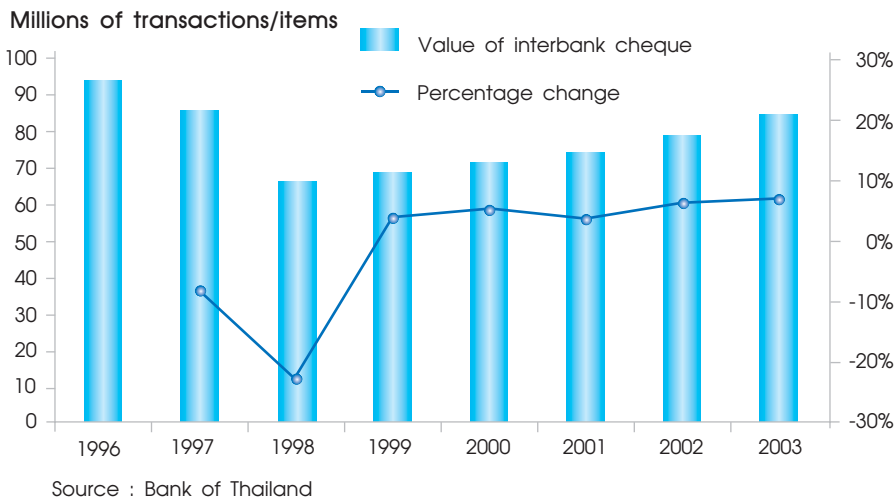


Figure 18 shows the value of interbank cheque declined significantly in 2000 as four types of transactions, namely, interbank loan, foreign exchange trading, securities trading across financial institutions, and non-resident funds transfer must be processed through BAHTNET since 10 March 2000. However, volume of interbank cheque transactions continued to increase although at a low growth rate (Figure 19).

In 2003 the growth rate of interbank cheque transaction volumes increased by 7 percent from 2002, while the growth rate for transaction values was 17 percent. This was mainly from the increase of interbank cheques in Bangkok and its vicinity (ECS), where the ratio was 73 percent and 91 percent of total interbank cheque transaction volumes and values, respectively. The B/C-3D system, which started on 14 February 2003 and the expansion of cheque collection to cover the branches of paying banks nationwide since 3 November 2003, has led to inter-district cheques originating from paying banks in the central region to be cleared within three working days. This largely increased the volume and value of B/C and reduced the volume of provincial cheques in 2003.

Table 5 shows that cheque used per capita was around 1.5 for Thailand, which was comparatively lower than other countries. However, the average value per cheque increased continuously since 2002 according to price adjustments with value per cheque around B260,000 in 2003. This followed large reductions in 2000 due to measures to divert high-value funds transfer transaction across commercial banks to BAHTNET.

3 Payment System Statistics

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Table 5 : Cheque Use Per Capita, 2001

Country	Cheque use per capita
Belgium	6
Canada	51
France	71
Germany	4
Hong Kong	20
Italy	11
Japan	2
Netherlands	0
Singapore	22
Sweden	0
Switzerland	1
United Kingdom	43
United States	145
Thailand (2001-2003)	1.5

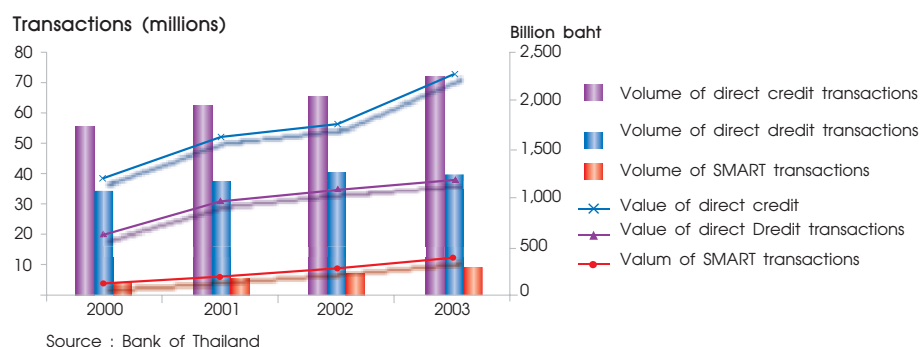
Source: CPSS-Red Book Statistical Update, April 2003

3.3.3 Pre-Authorized Direct Debit/Direct Credit

Pre-authorized payment systems are for retail funds transfers that are small in value, periodic, large in volume, and have an advanced agreement. Services are provided at the intra-bank level for direct credit transactions (salary, wages, dividends, tax returns, and other) and direct debit transactions (utility payments, insurance, credit card payment, and other). Services at

the interbank level are provided through the SMART system, which is operated by the BOT and where only direct credit service is currently provided.

FIGURE 20 : VOLUME AND VALUE OF PRE-AUTHORIZED FUNDS TRANSFER TRANSACTIONS



In 2003 the total value of pre-authorized payments was B3.8 trillion or around 121 million transactions. Around 90 percent of transactions originated at the intra-bank level where the largest proportion was for direct credit transactions with the volume and value ratio of 59 percent. The number of direct debit transactions, however, declined due to alternative payment channels for goods and services through counter services provided by the Post Office's Pay at Post, 7-Eleven, along with ATMs.

3 Payment System Statistics

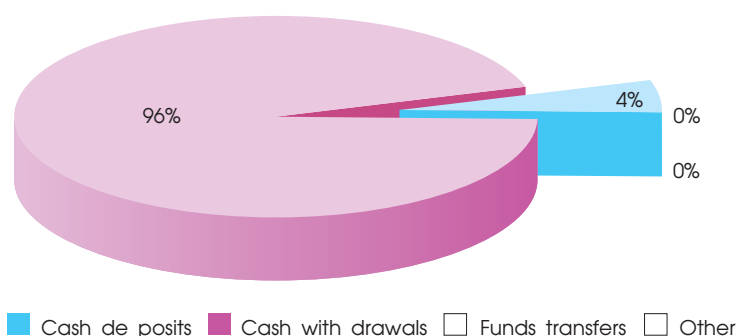
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Although the volume and value of pre-authorized payment transactions at the interbank level (or SMART) are comparatively low at system-level or at 9.4 million transactions and B385 billion, respectively, the growth rate for transaction volume and value in 2003 was relatively high at 28 percent and 41 percent, respectively. Foreign commercial bank branches remain the largest senders of transactions or 78 percent of total transactions. Transaction volume was largely from salary, wage, and pension payments. Transaction value was largely from goods and services payments.

3.3.4 Plastic Cards¹⁷

Plastic cards have become the most popular payment means for the general public. In 2003 the number of ATM card transactions totaled 655 million transactions.¹⁸ The total value of ATM and credit card transactions totaled B3.2 trillion, where 89 percent was from ATM card payments or B2.9 trillion, and B0.3 trillion was from credit card payments.

FIGURE 21 : PROPORTION OF ATM TRANSACTIONS BY TYPE



Source : Bank of Thailand

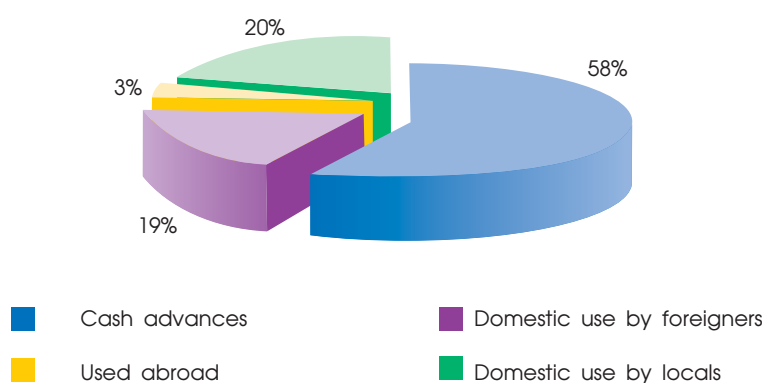
¹⁷ ATM and credit cards

¹⁸ The number of credit card transactions is not available.

Although the volume and value of ATM card transactions and growth rates have been relatively high in 2003, along with a majority of transactions, or around 96 percent of total transactions being cash withdrawals, there has been a gradual decline. This is due to the continued growth of intra-bank funds transfer transaction volumes, which grew to four percent of total transaction in 2003.

In addition, the popularity of using ATMs for interbank funds transfers or ORFT (Online Retail Funds Transfer) doubled in 2003 from the previous year with total transaction volume at 14.1 million transactions and total transaction value at B87.1 billion.

FIGURE 21 : PROPORTION OF ATM TRANSACTIONS BY TYPE



Source : Bank of Thailand

In 2003, credit card payments, 76 percent or B259 million were for domestic payments of which 57 percent by locals and 19 percent by foreigners. Credit card payments abroad totaled B11.1 trillion or 3 percent. Of particular interest is the relatively high value for credit card cash advance at B69 trillion or 20 percent of total transaction value in 2003, increasing by 5 times from 2002.

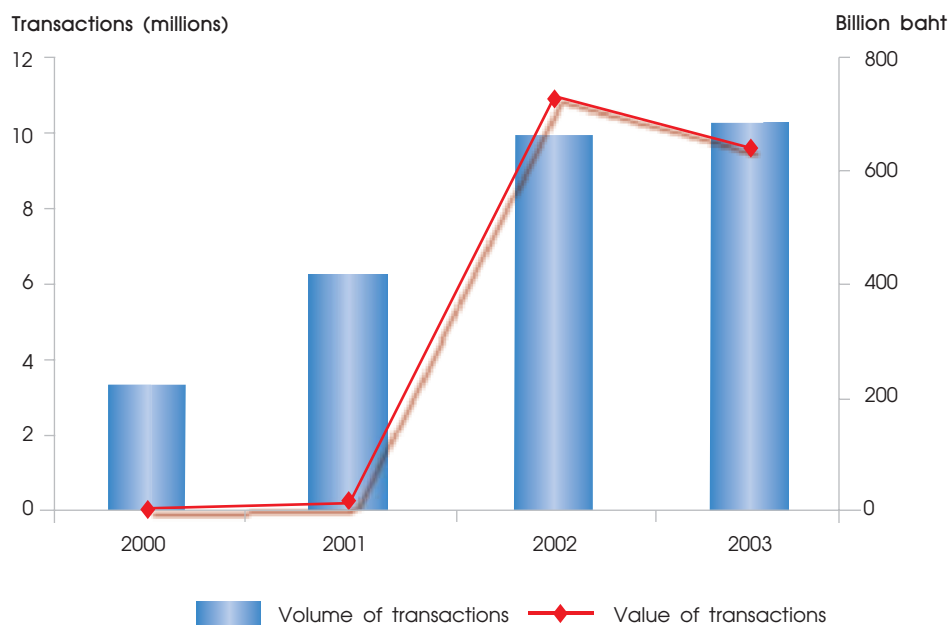
3 Payment System Statistics

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3.3.5 Internet Banking

Although the survey by the National Statistical Office found that the number of Internet users in Thailand increased to 6.03 million persons in 2003, but the purpose was largely for searching for information and sending electronic mail. Moreover, although the number of Internet subscribers increased to 348,965 in 2003 due to promotions and free service charges, the perception of users towards using payment services through Internet banking remained relatively low. This can be seen from the small increase in transaction volume in 2003, which was at 10.3 million transactions with total transaction value decreasing to B638 billion .

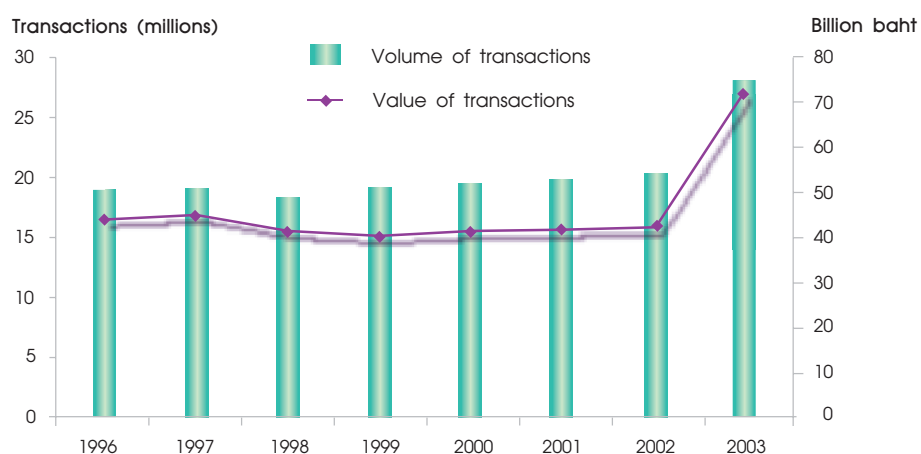
FIGURE 23 : VOLUME AND VALUE OF INTERNET BANKING TRANSACTIONS



Source : Bank of Thailand

3.3.6 Postal Payments

FIGURE 24 : VOLUME AND VALUE OF POSTAL PAYMENT TRANSACTIONS



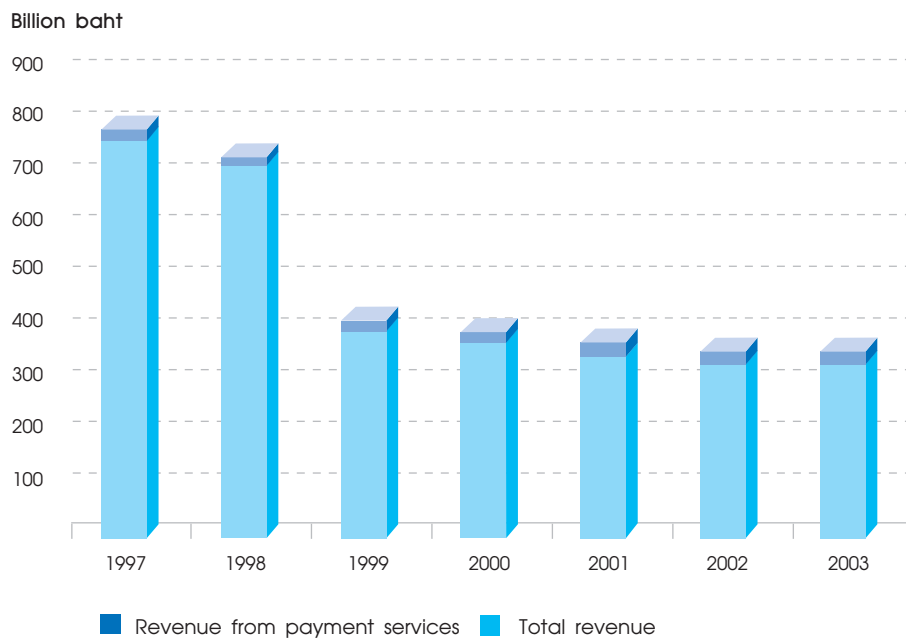
Source : Thailand Post

In 2003 the growth rates of postal payment transaction volume and value were relatively high at 39 percent and 72 percent, respectively. Total transaction volume was at 28 million transactions and total transaction value was at B72.4 billion. This largely stemmed from the Pay at Post services, while there were slight changes for domestic money orders, domestic postal orders, post cheques, and international money orders.

3.4 Revenue from Payment Services

Commercial bank income is divided into two major sources, including interest and dividend income, and non-interest income or fee-based and services income, which is largely from related payment services. As a result of interest rate reductions, commercial bank income has also declined accordingly. Income from payment services has gained importance and has continuously increased by 7 percent of total income between 2002-2003 or B22.9 billion of the total income of B338.4 billion.

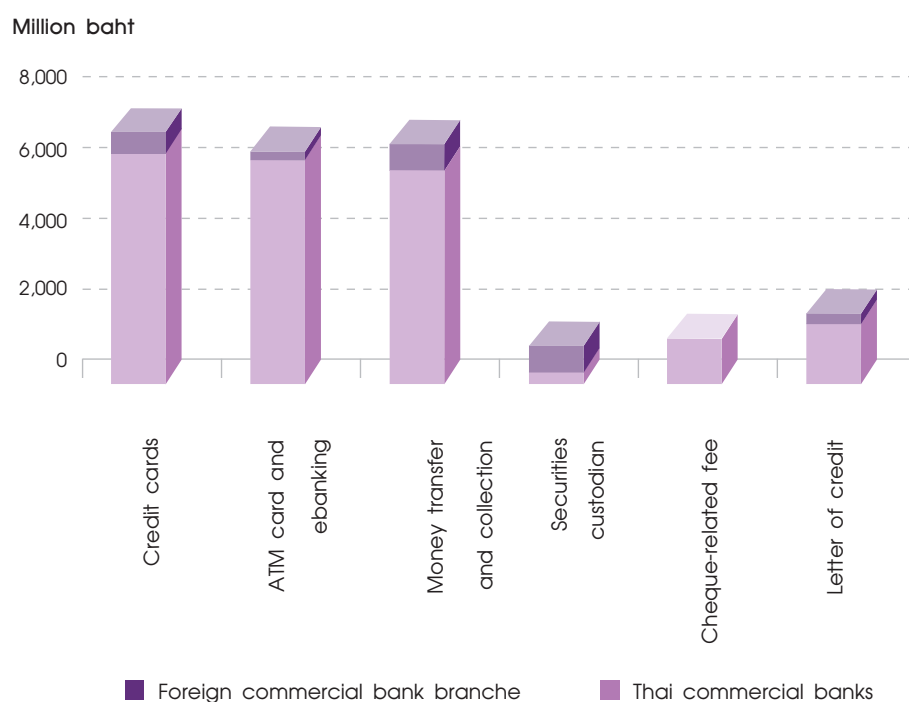
FIGURE 25 : REVENUE FROM PAYMENT SERVICE



Source : Bank of Thailand

In 2003 Thai commercial banks continued to have a high proportion of income from payment services, which was as high as 89 percent. Around 85 percent were derived from credit cards, ATM cards, and electronic banking services and money transfer and collection, with portions of 30 percent, 29 percent and 27 percent, respectively. For foreign commercial bank branches, the major source of payment service income were from money transfer and collection, securities custodian, and credit cards, which were 30 percent, 28 percent, and 21 percent, respectively.

FIGURE 26 : REVENUE FROM PAYMENT SERVICERS BY TYPE IN 2003



Source : Bank of Thailand

4 List of Abbreviations

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ATM	Automated Teller Machine
BAHTNET	Bank of Thailand Automated High-Value Transfer Network (a high-value funds transfer payment system)
BIS	Bank for International Settlements
B/C	Bill for Collection (cheque collection across clearinghouses in different zones)
BOT	Bank of Thailand
CPSS	Committee on Payment and Settlement Systems
ECB	European Central Bank
ECS	Electronic Cheque Clearing System (an interbank cheque clearing system for Bangkok and its vicinity)
EFTPOS	Electronic Funds Transfer at the Point of Sale
GDP	Gross Domestic Product

IMF	International Monetary Fund
ITMX	Interbank Transaction Management and Exchange
MAS	Monetary Authority of Singapore
NITC	National Information Technology Committee
ORFT	Online Retail Funds Transfer
PSC	Payment Systems Committee
PSG	Payment Systems Group
ROSCs	Reports on the Observance of Standards and Codes
SIPS	Systemically Important Payment Systems
SMART	System for Managing Automated Retail Funds Transfer (a retail payment system)
SNPC	Subcommittee on National Payments Co-operation
STP	Straight Through Processing
SWIPS	System-Wide Important Payment Systems
TPA	Thailand Payments Association

5

Article:

The roles and experiences of the Bank of Thailand in risk reduction and efficiency enhancement in the payment system *

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The Bank of Thailand was one of the earliest central banks in Southeast Asia to adopt the real-time gross settlement system since 1995 when compared to other countries in the region such as Singapore (1998), Malaysia (1999), Indonesia (2000), and the Philippines (2002).

Empirical studies by the Payment Systems Group found that the adoption of BAHTNET (Bank of Thailand Automated High-value Transfer Network) was a major progress in the national payment system infrastructure where risks have been largely reduced. As financial transactions are settled individually and immediately in real-time, credit risk and settlement risk are eliminated. In addition, there is a continuous settlement mechanism that differs from the deferred net settlement (DNS) system based on the single netting of settlements at the closing time of 5.00 p.m. This new mechanism also helps increase the flexibility of commercial banks in managing risks in determining the timing of payment submissions to BAHTNET, which is in accordance with the incoming and outgoing payment patterns, along with funds and risks management by each commercial bank.

* Sayan Pariwat, Senior Director and Rungsun Hataiseree, Team Executive, Payment Systems Group

Empirical evidence regarding the baht reconciliation times appears to suggest that changes to the large-value funds transfers through the establishment of the BAHTNET system has contributed to reducing the foreign exchange settlement risk for the Thai baht leg of foreign exchange transactions. Empirical evidence has shown that the reconciliation times for the Thai baht tends to be shorter under RTGS compared with those settled under the DNS system, which are subject to settlement delays as cheques are used as a payment mean and where settlement finality requires results from the cheque return round. Empirical evidence of baht reconciliation times also suggest the reduction of foreign exchange settlement risks, which is a result of using the RTGS under BAHTNET as compared to the previous DNS system.

Table 1 : Salient features of the Thai payment system: before and after the introduction of the BAHTNET system

	Before May 1995	Now
Systemic risk	High	Reduced by over 80 percent
• Credit risk	High	Substantially reduced by over 80 percent
• Liquidity risk	Moderate	Partially reduced (partially through the improvement of the efficient ratio)
• FX settlement risk	High	Partially reduced (partially through the shorter times of baht reconciliation)
• Timely settlement	Next day	Continuously

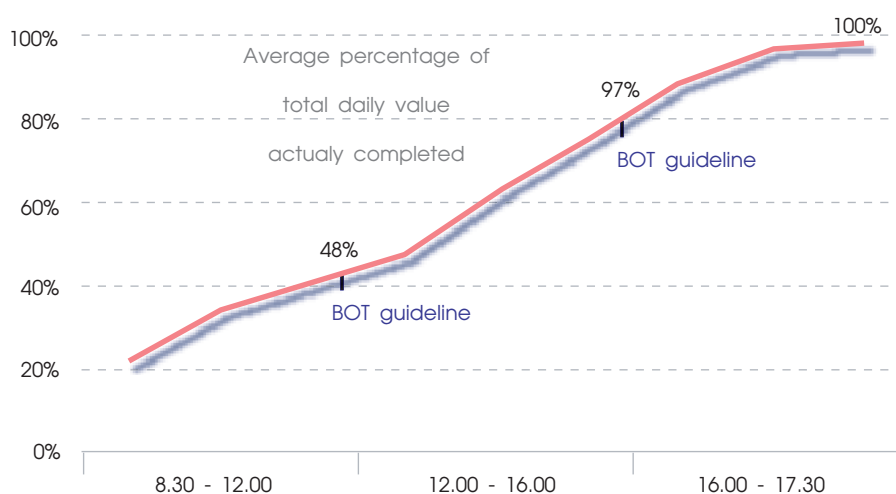
Empirical studies also found that the different types of risks, as illustrated in Table 1, are a result of applying BAHTNET payment mechanisms and using certain supporting measures of the BOT. This has improved efficiency in large-value funds transfers in BAHTNET along with changing the behaviour of market participants to comply with the authority’s strategic framework of reducing risk in the payment system.

(1) The 30:70 throughput guideline. This guideline was introduced to reduce systemic risk and to ensure the smooth operation of the settlement process. Participants are encouraged to submit payment instructions to the BAHTNET system earlier in the day to facilitate payment flows across members in the system. The BOT issued an order which requires that “participants transferring funds in BAHTNET at B500 million on average are required to send funds

transfer instructions amounting to at least 30 percent of their daily average funds transfer value prior to 12.00 noon and up to at least 70 percent prior to 3.00 p.m.”

Evidence from the period following the 30:70 throughput guideline clearly indicated that participants submitted payment instructions to BAHTNET earlier at approximately 2.00 p.m. as compared to a majority of payments being submitted near closing time before the above guideline was introduced. Figure 1, which is based on data from early-2004, further suggests that participants were able to submit payment instructions according to the guideline, where 55.6 percent submitted payment instructions by 12.00 noon and 89.3 percent by 3.00 p.m. This was higher than the 30 percent and 70 percent ratio stipulated by the authorities.

**FIGURE 1 : CUMULATIVE VALUE OF SETTLEMENTS IN BAHTNET,
(DECEMBER 22-26 2003/JANUARY 12-16, 2004)**

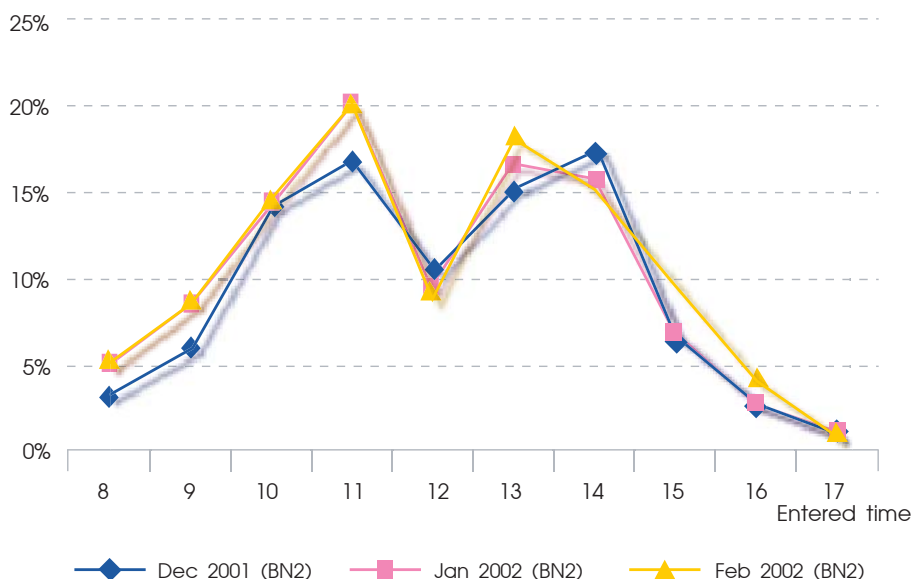


Source : Payment Systems Group, Bank of Thailand

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(2) **Pricing-incentive scheme.** Under this scheme, market participants are charged with different prices depending on the times at which instructions for funds transfers are sent to BAHTNET in order to motivate an early sending of transfer instructions into the system (pricing is time-based). Earlier time zones are charged a relatively low rate. Figure 2 indicates that as a result of the pricing-incentive scheme, it was evident that the peak periods in the transmission of payment instructions to the system have been moved up by nearly three hours from the peak period of 2.00 p.m., prior to the introduction of the scheme, to 11.00 a.m. in the period afterwards.

FIGURE 2 : DAILY PEAK OF INCOMING TRAFFIC PATTERN OF BAHTNET

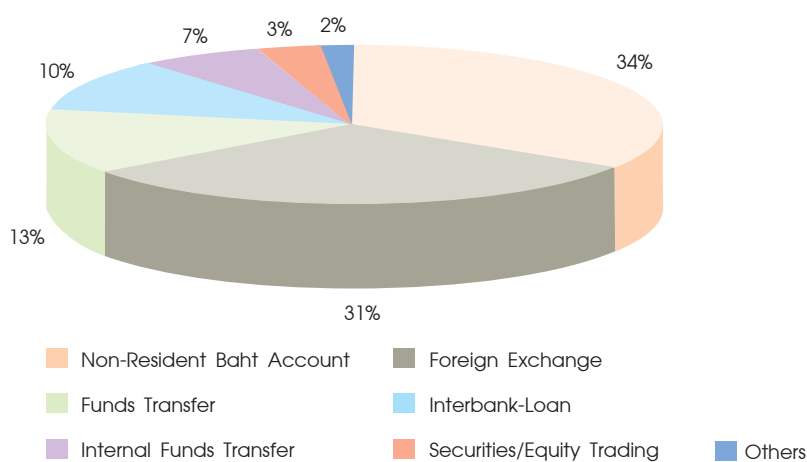


Source : Payment Systems Group, Bank of Thailand

This change in the behaviour of the market practice with respect to the sending of payment instructions seems to have been influenced by the two policy measures mentioned above. This change has helped ensure the smooth operation of the settlement process and to avoid the heavy congestion of payment instructions, particularly in the afternoon.

(3) High-value cheque migration agreement. This supporting measure has been an important factor in reducing the value of cheque transactions in Bangkok and its vicinity since 2000. Figure 3 illustrates the change in the pattern of payment method for high-value payment from cheque to BAHTNET which resulted in the substantial reduction of credit risk among the market participants by approximately 80 percent considering total value of the four types of funds transfers that shifted from cheques to BAHTNET as follows: (a) funds transfers for non-residents, (b) interbank foreign exchange transactions for baht leg, (c) interbank loans, and (d) securities-related fund transfers.

FIGURE 3 : THE SHARE IN MAJOR DOMESTIC INTERBANK FUND TRANSFERS, 2000-2003

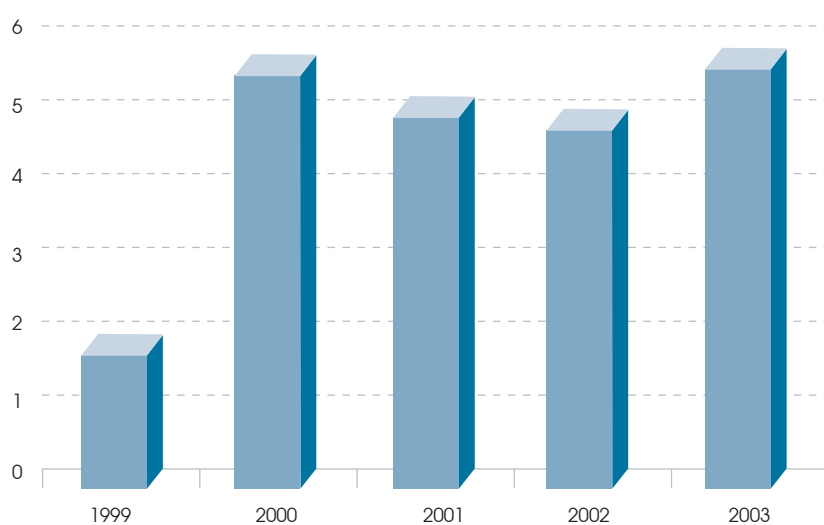


Source : Payment Systems Group, Bank of Thailand

(4) Intra-day liquidity facility. Under this measure, liquidity injections are provided for BAHTNET members during the day. BAHTNET participants that transfer funds exceeding B500 million on average daily are required to maintain intraday liquidity (government securities are used as collateral) that is at least 10 percent of transaction values submitted through the system for a two-week average in the previous month. Users of the facility are required to make ILF repayment by 5.30 p.m., while an interest of 1.5

percent plus the 14-day repurchase rate is charged for re-payments exceeding the specified time. These measures facilitated the smooth operation of BAHTNET, particularly under tight economic and financial conditions. Figure 4 illustrates that the "efficient ratio" showed signs of significant improvements from "1.9" to "5.6" over the years 1999-2002. Change in the ratios suggests that banks were able to handle a large turnover of funds transfer with the relatively similar amount of available funds by using their funds management strategy. In addition, banks have a tendency to use the liquidity provided by the BOT in a more efficient manner enabling reductions in liquidity risks and increasing system stability and safety.

FIGURE 4 : RATIO OF TURNOVER/AVAILABLE ILF IN BAHTNET (EFFICIENCY RATIO)



Source : Payment Systems Group, Bank of Thailand

(5) **Gridlock resolution.** These are automated tools that have been developed to handle the queue of funds transfer instructions that are unable to be settled due to the inadequacy of funds in the sending institution's account. Payment instructions remain queued until the sender has sufficient funds to settle them. When several instructions from various institutions stand in the queue, the system will search for the group of transactions and calculate the net position of each institution. If the net balance of each related institution is a positive amount, the system will then process all the related instructions simultaneously. Evidence suggests that this measure has helped participants with initial liquidity shortfalls in the proportion of 10 percent of total transaction values in BAHTNET during January-December 2002.

(6) Use of credit balance from cheque clearing. The BOT has allowed member banks to use the credit balance from the normal round of cheque clearing operations to settle any drawn ILF credit line or other funds transfer instructions in BAHTNET. Members must have an allocated ILF credit line above 10 percent of the average funds transfer value in BAHTNET in the past two weeks. Members can also maintain ILF for each day during the two-week period above 10 percent for the total value of daily transactions or the average transaction value for the two-week period in the previous month (depending on which amount is lower).

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TABLE 1 : BASIC STATISTICAL DATA

	1999	2000	2001	2002	2003 ^P
Population (millions)	61.66	61.87	62.30	62.80	62.77
GDP current price (billion baht)	4,637.10	4,916.50	5,123.40	5,399.60	5,939.06
GDP per capita (baht)	75,204.35	79,465.01	82,237.56	85,980.89	94,616.22
Exchange rate vis-à-vis US\$ (at year-end)	37.84	40.16	44.48	43.28	41.50

Sources : Bank of Thailand, Department of Local Administration, National Economic & Social Development Board

^P Preliminary Data

TABLE 2 : TECHNOLOGICAL INFRASTRUCTURE

	1999	2000	2001	2002	2003
Total fixed network telephone subscribers (millions)	5.20	5.67	6.11	6.56	6.61
TOT	2.72	2.92	3.17	3.35	3.52
TA	1.33	1.57	1.76	2.01	1.91
TT&T	1.15	1.18	1.18	1.20	1.18
Total mobile telephone subscribers (millions)	2.34	3.64	8.00	17.41	22.38
Postpaid	2.29	3.12	4.84	4.51	4.35
Prepaid	0.05	0.52	3.16	12.90	18.03
Total Internet users (millions)	1.50	2.30	3.50	4.80	6.03
Penetration rates					
Fixed network telephone (%)	8.43	9.16	9.81	10.45	10.53
Mobile telephone (%)	3.80	5.88	12.84	27.72	35.65
Internet (%)	2.43	3.72	5.62	7.64	9.61

Sources : Communications Authority of Thailand, Telephone Organization of Thailand, National Electronics and Computer Technology Center

TABLE 3 : NARROW MONEY : M1¹ (AT YEAR-END, MILLION BAHT)

	1999	2000	2001	2002	2003 ^P
Currency	587,396	475,120	512,471	583,094	661,785
Held by government	29,250	8,146	9,540	8,977	16,358
Held by commercial banks	85,740	60,133	62,047	78,087	98,478
Held by business and household sector	466,117	401,714	436,346	490,277	539,032
Held by other financial institutions	6,290	5,127	4,538	5,753	7,917
Demand deposits	223,300	221,273	226,179	293,549	328,620
Held by government	64,422	47,326	37,845	75,643	57,187
Held by commercial banks	56,245	55,097	49,792	50,442	51,582
Held by business and household sector	88,963	104,118	126,932	154,036	197,248
Held by other financial institutions	13,670	14,732	11,611	13,428	22,603
Money supply (M1)	555,080	555,832	563,278	644,313	736,281
Currency held by business and household sector as % of M1	84%	79%	77%	76%	73%
Demand deposits held by business household sector as % of M1	16%	21%	23%	24%	27%

Source : Bank of Thailand

¹ Cash in circulation and demand deposits held by business and household sector

^P Preliminary data

TABLE 4 : SETTLEMENT MEDIA USED BY NON-BANKS (AT YEAR-END, BILLION BAHT)

	1999	2000	2001	2002	2003
Banknotes and coins ¹	466	402	436	490	539
Demand deposits ²	89	104	127	154	197
Narrow money supply (M1) ³	555	506	563	644	736
Broad money supply (M2) ⁴	4,835	5,013	5,228	5,360	5,611

Source: Bank of Thailand

¹ Banknotes and coins held by business and household sector

² Demands deposits held by businesses and household sector

³ Sum of currency and demand deposits held by business and household sector

⁴ M1 plus business and household sector time and savings deposits in the commercial banking system

TABLE 5 : SETTLEMENT MEDIA USED BY BANKS (AT YEAR-END, BILLION BAHT)

	1999	2000	2001	2002	2003
Balances held at central bank	50	52	46	48	46
Required reserves	282	292	308	315	323
Free reserves	477	889	1,065	1,117	1,169
Transferable deposits at other banks	33	33	36	37	4
Memorandum item :					
Institutions borrowing from central bank	48	26	17	19	20

Source : Bank of Thailand

TABLE 6 : INDICATORS OF THE USE OF VARIOUS CASHLESS PAYMENT INSTRUMENTS. VOLUME OF TRANSACTIONS (IN THOUSANDS)

	1999	2000	2001	2002	2003
Paper-based :					
Cheque	68,609	72,059	74,497	79,116	84,566
Payment cards :					
ATM card	333,585	383,599	456,602	557,949	654,930
Credit card	nav.	nav.	nav.	nav.	nav.
Automated :					
Credit transfer ¹	nav.	54,998	62,702	65,506	72,115
Direct debit ²	nav.	34,053	37,713	40,192	39,669
SMART	2,790	4,107	5,758	7,369	9,453
BAHTNET ³	255	644	748	803	964

Source : Bank of Thailand

¹ Intra-bank pre-authorized direct credit

² Intra-bank pre-authorized direct debit

³ Since 2002, data includes interbank funds transfer, third party funds transfer, DVP/RVP for securities and Multilateral Funds Transfer.

**TABLE 7 : INDICATORS OF THE USE OF VARIOUS CASHLESS
 PAYMENT INSTRUMENTS. VOLUME OF TRANSACTIONS (BILLION BAHT)**

	1999	2000	2001	2002	2003
Paper-based :					
Cheque	66,895	26,949	16,785	18,817	21,949
Payment cards :					
ATM card	938	1,287	1,827	2,210	2,876
Credit card	151	178	234	286	339 ^P
Automated :					
Credit transfer ¹	nav.	1,201	1,624	1,756	2,271
Direct debit ²	nav.	618	965	1,080	1,186
SMART	82	121	183	274	385
BAHTNET ³	6,603	64,317	70,900	67,095	78,140

Source : Bank of Thailand

¹ Intra-bank pre-authorized direct credit

² Intra-bank pre-authorized direct debit

³ Data includes interbank funds transfer, third party funds transfer, DVP/RVP for securities and Multilateral Funds Transfer since 2002

^P Preliminary data

TABLE 8 : NOTES AND COINS (AT YEAR-END, MILLION BAHT)

	1999	2000	2001	2002	2003
Notes and coins	587,396	475,120	512,471	583,093	661,785
Notes :	568,345	454,359	490,242	559,169	636,508
500000 baht	-	113	118	118	119
1000 baht	322,147	253,439	298,453	367,403	441,411
500 baht	172,319	126,537	115,803	108,987	105,452
100 baht	50,462	50,561	51,638	57,446	62,013
60 baht	404	413	417	439	447
50 baht	7,040	6,926	6,896	6,529	7,013
20 baht	11,682	12,211	13,161	14,648	16,536
10 baht	4,052	3,920	3,517	3,360	3,278
5 baht	123	123	123	123	123
1 baht	107	107	107	107	107
50 satang	9	9	9	9	9
Coins :	19,051	20,761	22,229	23,924	25,277

Source: Bank of Thailand

TABLE 9 : INSTITUTIONAL INFRASTRUCTURE

	1999	2000 ¹	2001	2002	2003 ²
Central Bank					
Number of Institutions	nav.	1	1	1	1
Number of Branches	nav.	4	4	4	4
Number of Accounts ³	nav.	1,201	1,091	1,153	1,123
Value of Accounts (million baht) ³	nav.	519,001	492,347	315,627	208,496
Commercial banks					
Number of Institutions	nav.	13	13	13	13
Number of Branches	nav.	3,746	3,683	3,650	3,730
Number of Accounts	nav.	44,983,370	47,276,792	48,810,007	49,854,304
Value of Accounts (million baht)	nav.	4,626,006	4,789,139	4,897,713	5,010,121
Specialized Financial Institutions:					
Government Savings Bank					
Number of Institutions	nav.	1	1	1	1
Number of Branches	nav.	577	577	586	587
Number of Accounts	nav.	13,672,897	13,672,897	28,824,269	30,029,258
Value of Accounts (million baht)	nav.	312,409	312,409	522,619	554,242
Government Housing Bank					
Number of Institutions	nav.	1	1	1	1
Number of Branches	nav.	68	68	69	71
Number of Accounts	nav.	360,238	360,238	359,243	348,073
Value of Accounts (million baht)	nav.	213,843	213,843	192,969	239,371
Bank for Agriculture and Agricultural Cooperatives					
Number of Institutions	nav.	1	1	1	1
Number of Branches	nav.	504	504	515	532
Number of Accounts	nav.	10,000,000	10,000,000	10,588,203	11,014,933
Value of Accounts (million baht)	nav.	196,414	196,414	275,028	307,194
Export-Import Bank of Thailand					
Number of Institutions	nav.	1	1	1	1
Number of Branches	nav.	6	7	8	8
Number of Accounts	-	-	-	-	-
Value of Accounts (million baht)	-	-	-	-	-
Small and Medium Enterprise Development Bank of Thailand					
Number of Institutions	-	-	-	-	1
Number of Branches	-	-	-	-	64
Number of Accounts	-	-	-	-	nav.
Value of Accounts (million baht)	-	-	-	-	nav.

Islamic Bank of Thailand					
Number of Institutions	-	-	-	-	1
Number of Branches	-	-	-	-	6
Number of Accounts	-	-	-	-	9,574
Value of Accounts (million baht)	-	-	-	-	612
Branches of foreign banks					
Number of Institutions	nav.	21	18	18	18
Number of Branches	nav.	21	18	18	18
Number of Accounts	nav.	194,266	202,372	256,338	206,866
Value of Accounts (million baht)	nav.	257,552	289,578	275,133	308,878
Post Office					
Number of Institutions	nav.	1	1	1	1
Number of Branches	nav.	1,170	1,170	1,148	1,148
Number of Accounts	nav.	-	-	-	-
Value of Accounts (million baht)	nav.	-	-	-	-

Sources : Bank of Thailand and Communications Authority of Thailand

¹ Data collected since 2000

² Data of commercial banks and branches of foreign banks were as of June 2003

³ Excludes regional offices

TABLE 10 : PAYMENT INSTRUCTIONS HANDLED BY SELECTED INTERBANK SETTLEMENT SYSTEMS. VOLUME OF TRANSACTIONS (IN THOUSANDS)

	1999	2000	2001	2002	2003
Paper-based:					
ECS	51,379	53,313	55,186	58,139	62,020
Provincial Cheques	17,230	18,746	19,311	20,595	19,858
B/C ¹	neg.	neg.	neg.	382	2,688
Automated:					
BAHTNET ²	255	644	748	803	964
SMART (Media Clearing)	2,790	4,107	5,758	7,369	9,453
ATM-ORFT (On-line Retail Funds Transfer) ³	nav.	527	3,198	5,989	14,110

Sources : Bank of Thailand, Processing Center Co., Ltd.

¹ Inter-provincial cheques exchanged at the Electronic Clearing House

² Since 2002, data includes interbank funds transfer, third party funds transfer, DVP/RVP for securities and Multilateral Funds Transfer.

³ Data collected since 2000

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TABLE 11 : PAYMENT INSTRUCTIONS HANDLED BY SELECTED INTERBANK SETTLEMENT SYSTEMS. VOLUME OF TRANSACTIONS (BILLION BAHT)

	1999	2000	2001	2002	2003
Paper-based:					
ECS	65,510	25,436	15,181	16,987	19,916
Provincial Cheques	1,386	1,513	1,604	1,814	1,923
B/C ¹	neg.	neg.	neg.	16	111
Automated:					
BAHTNET ²	6,603	64,317	70,900	67,095	78,140
SMART (Media Clearing)	82	121	183	274	385
ATM-ORFT (On-line Retail Funds Transfer) ³	nav.	3	15	38	87

Source : Bank of Thailand

¹ Inter-provincial cheques exchanged at the Electronic Clearing House² Since 2002, data includes interbank funds transfer, third party funds transfer, DVP/RVP for securities and Multilateral Funds Transfer.³ Data collected since 2000

TABLE 12 : SECURITIES TRANSFER INSTRUCTIONS HANDLED BY SECURITIES SETTLEMENT SYSTEMS. VOLUME OF TRANSACTIONS (IN MILLIONS)

	1999	2000	2001	2002	2003
Bond registry system :					
Equity securities	-	-	-	-	-
Government securities	neg.	neg.	neg.	neg.	neg.
Book-entry system :					
Equity securities	1.12	1.00	1.00	1.00	1.94
Government securities	neg.	neg.	neg.	neg.	neg.

Sources : Bank of Thailand and Thailand Securities Depository Co., Ltd.

TABLE 13 : SECURITIES TRANSFER INSTRUCTIONS HANDLED BY SECURITIES SETTLEMENT SYSTEMS. VALUE OF TRANSACTIONS (BILLION BAHT)

	1999	2000	2001	2002	2003
Bond registry system :					
Equity securities	-	-	-	-	-
Government securities	800	988	612	69	9
Book-entry system:					
Equity securities	251	161	177	237	428
Government securities	70	345	1,016	2,091	3,053

Sources : Bank of Thailand and Thailand Securities Depository Co., Ltd.

TABLE 14 : NUMBER OF PARTICIPANTS IN SELECTED PAYMENT AND SETTLEMENT SYSTEMS

	1999	2000	2001	2002	2003
BAHTNET	76	77	69	65	72
ECS	38	38	36	36	37
Provincial Cheque Clearing	17	17	17	17	17
B/C ¹	-	-	-	-	35
SMART	26	27	28	27	28
Bond registry system :					
Equity securities	-	-	-	-	-
Government securities	13,141	16,540	27,220	157,358	142,586
Book-entry system :					
Equity securities	59	58	56	57	57
Government securities	418	974	1,053	1,202	1,307

Sources: Bank of Thailand and Thailand Securities Depository Co., Ltd.

¹ Inter-provincial cheques exchanged at the Electronic Clearing House

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TABLE 15 : NUMBER OF ATM

	1999	2000	2001	2002	2003
Total	5,322	5,901	6,385	7,885	9,118

Source : Bank of Thailand

TABLE 16 : NUMBER OF EFTPOS TERMINALS

	1999	2000	2001	2002 ^P	2003 ^P
Total	nav.	nav.	nav.	61,000	76,000

Source: Bank of Thailand

^P Preliminary data

TABLE 17 : NUMBER OF PAYMENT CARDS

	1999	2000	2001	2002	2003
Total	19,095,005	22,447,422	26,350,803	30,227,210	33,890,657
Credit card	1,629,301	1,765,640	2,567,961	3,425,052	4,224,362
ATM card	17,465,704	20,681,782	23,782,842	26,802,158	29,666,295

Source : Bank of Thailand

^P Preliminary dataTABLE 18 : USE OF POSTAL PAYMENT INSTRUMENTS.
NUMBER OF TRANSACTIONS (IN MILLIONS)

	1999	2000	2001	2002	2003
Postal payments total	19.29	19.73	19.89	20.27	28.11
Domestic money order total ¹	16.78	17.26	17.50	18.06	26.26
Domestic postal order	2.43	2.40	2.33	2.16	1.80
Postcheque	0.02	0.01	0.00	0.00	0.00
International money order	0.06	0.06	0.06	0.06	0.05
Incoming	0.06	0.06	0.06	0.05	0.05
Outgoing	0.00	0.00	0.00	0.00	0.00

Source : Communications Authority of Thailand

¹ Includes domestic money order and Pay at Post

**TABLE 19 : USE OF POSTAL PAYMENT INSTRUMENTS.
 VALUE OF TRANSACTIONS (BILLION BAHT)**

	1999	2000	2001	2002	2003
Postal payments total	40.56	41.51	41.76	42.35	72.37
Domestic money order total ¹	38.90	39.92	40.18	40.77	70.77
Domestic postal order	0.63	0.64	0.65	0.63	0.58
Postcheque	0.11	0.04	0.03	0.01	0.00
International money order	0.92	0.91	0.90	0.94	1.02
Incoming	0.90	0.89	0.88	0.90	0.98
Outgoing	0.02	0.02	0.02	0.04	0.05

Source : Communications Authority of Thailand

¹ Includes domestic money order and Pay at Post

**TABLE 20 : SOURCES OF PAYMENT REVENUES OF
 THAI COMMERCIAL BANDS (MILLIONS BAHT)**

	1999	2000	2001	2002	2003
Total	13,131	14,761	17,744	19,589	22,280
Credit card	3,709	4,220	5,448	6,489	6,606
ATM card and e-banking	2,734	3,394	4,327	5,209	6,376
Money transfer and collection	4,142	4,348	4,605	4,877	6,018
Securities custodian	237	250	563	313	348
Cheque-related fee	795	904	1,232	1,106	1,260
Letter of credit	1,514	1,645	1,569	1,595	1,672

Source : Bank of Thailand

**TABLE 21 : SOURCES OF PAYMENT REVENUES OF
 FOREIGN BANK BRANCHES (MILLIONS BAHT)**

	1999	2000	2001	2002	2003
Total	3,361	2,849	2,783	2,852	2,651
Credit card	1,447	1,041	931	1,076	557
ATM card and e-banking	138	63	79	110	185
Money transfer and collection	673	764	830	806	794
Securities custodian	819	644	491	593	745
Cheque-related fee	37	36	44	38	53
Letter of credit	247	301	408	229	317

Source: Bank of Thailand

**TABLE 22 : DAILY AVERAGES OF BOT PAYMENT SERVICES.
VOLUME OF TRANSACTIONS (TRANSACTIONS)**

	1999	2000	2001	2002	2003
BAHTNET ¹	1,042	2,608	3,042	3,277	3,904
ECS	209,711	214,971	224,335	237,302	251,093
Provincial Cheque Clearing	76,514	77,866	78,500	83,993	80,396
B/C ²	nav.	nav.	nav.	nav.	10,882
SMART	11,375	16,549	23,517	30,051	38,272

Source : Bank of Thailand

¹ Since 2002, data includes interbank funds transfer, third party funds transfer, DVP/RVP for securities and Multilateral Funds Transfer.

² Inter-provincial cheques exchanged at the Electronic Clearing House

**TABLE 23 : DAILY AVERAGES OF BOT PAYMENT SERVICES.
VALUE OF TRANSACTIONS (BILLION BAHT)**

	1999	2000	2001	2002	2003
BAHTNET ¹	27	260	288	274	316
ECS	267	103	62	69	81
Provincial Cheque Clearing	6.2	6.5	6.5	7.4	7.8
B/C ²	nav.	nav.	nav.	nav.	0.5
SMART	0.3	0.5	0.8	1.1	1.6

Source : Bank of Thailand

¹ Since 2002, data includes interbank funds transfer, third party funds transfer, DVP/RVP for securities and Multilateral Funds Transfer.

² Inter-provincial cheques exchanged at the Electronic Clearing House

**TABLE 24 : PEAK DAY FIGURES OF BOT PAYMENT SERVICES.
VOLUME OF TRANSACTIONS (TRANSACTIONS)**

	1999	2000	2001	2002	2003
BAHTNET ¹	1,684	4,468	4,908	5,109	6,115
ECS	537,593	541,738	525,726	629,130	546,858
Provincial Cheque Clearing	nav.	192,268	196,266	229,252	227,501
B/C ²	nav.	nav.	nav.	nav.	120,104
SMART	62,480	65,428	118,440	155,623	193,870

Source : Bank of Thailand

¹ Since 2002, data includes interbank funds transfer, third party funds transfer, DVP/RVP for securities and Multilateral Funds Transfer.

² Inter-provincial cheques exchanged at the Electronic Clearing House

**TABLE 25 : PEAK DAY FIGURES OF BOT PAYMENT SERVICES.
 VALUE OF TRANSACTIONS (BILLION BAHT)**

	1999	2000	2001	2002	2003
BAHTNET ¹	229	518	501	967.2	525.8
ECS	505	450	118	160.3	160.0
Provincial Cheque Clearing	nav.	10.5	12.2	14.8	14.6
B/C ²	nav.	nav.	nav.	nav.	3.7
SMART	2.1	2.7	4.9	8.0	9.5

Source: Bank of Thailand

¹ Since 2002, data includes interbank funds transfer, third party funds transfer, DVP/RVP for securities and Multilateral Funds Transfer.

² Inter-provincial cheques exchanged at the Electronic Clearing House

TABLE 26 : USE OF INTERNET BANKING¹

	1999	2000	2001	2002	2003
No. of agreements	nav.	21,102	97,101	254,989	348,965
Volume of transactions	nav.	3,300,000	6,243,407	9,990,969	10,336,929
Value of transactions (billion baht)	nav.	0.3	8.6	730.5	638.0

Source : Commercial banks

¹ Data collected since 2000

TABLE 27 : CARD FRAUD

	1999	2000	2001	2002 ^P	2003 ^P
Losses (million baht)	nav.	nav.	nav.	32	47

Source : Bank of Thailand

^P Preliminary data

Symbols used	Definition
" _ "	- No data
"nav."	- Data not collected or not available
"neg."	- Data has very low value as compared to other data in the same table.
"0"	- Data equals to or is near zero.

- Table 1:**
- GDP at current prices
 - Foreign exchange rates are annual averages.
- Tables 6-7:**
- Data on credit transfers is based on intra-bank pre-authorized direct credit transactions.
 - Data on debit transfers is based on intra-bank pre-authorized direct debit transactions.
 - Data for BAHTNET includes interbank funds transfer, third-party funds transfer, DVP/RVP for securities and Multilateral Funds Transfer from 2002.
- Table 9:**
- Data excludes the number and value of accounts at the Bank of Thailand Branches.
- Tables 10-11:**
- Data on ATM-ORFT available from 2000.
 - Data on inter-provincial cheques includes only inter-provincial cheques exchanged at the Electronic Clearing House in Bangkok.
 - Data for BAHTNET includes interbank funds transfer, third-party funds transfer, DVP/RVP for securities and Multilateral Funds Transfer from 2002.

- Tables 12-13:** • Equity securities settlement is only processed through the scripless book entry system.
- Table 17:** • Since Q4, 2002, data on credit cards has been based on new reporting requirements issued on 12 November 2002 (BOT's Notificication No.FPG.(21)C.207/2545) and excluded credit card data from non-financial institutions.
- Tables 18-19:** • Data on domestic money orders includes payment services from Pay at Post.
- Tables 22-25:** • Data on inter-provincial cheques includes only cheques exchanged at the Electronic Clearing House in Bangkok.
- Data for BAHTNET includes interbank funds transfer, third-party funds transfer, DVP/RVP for securities and Multilateral Funds Transfer from 2002.
- Table 27:** • Data is based on credit card company surveys.

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