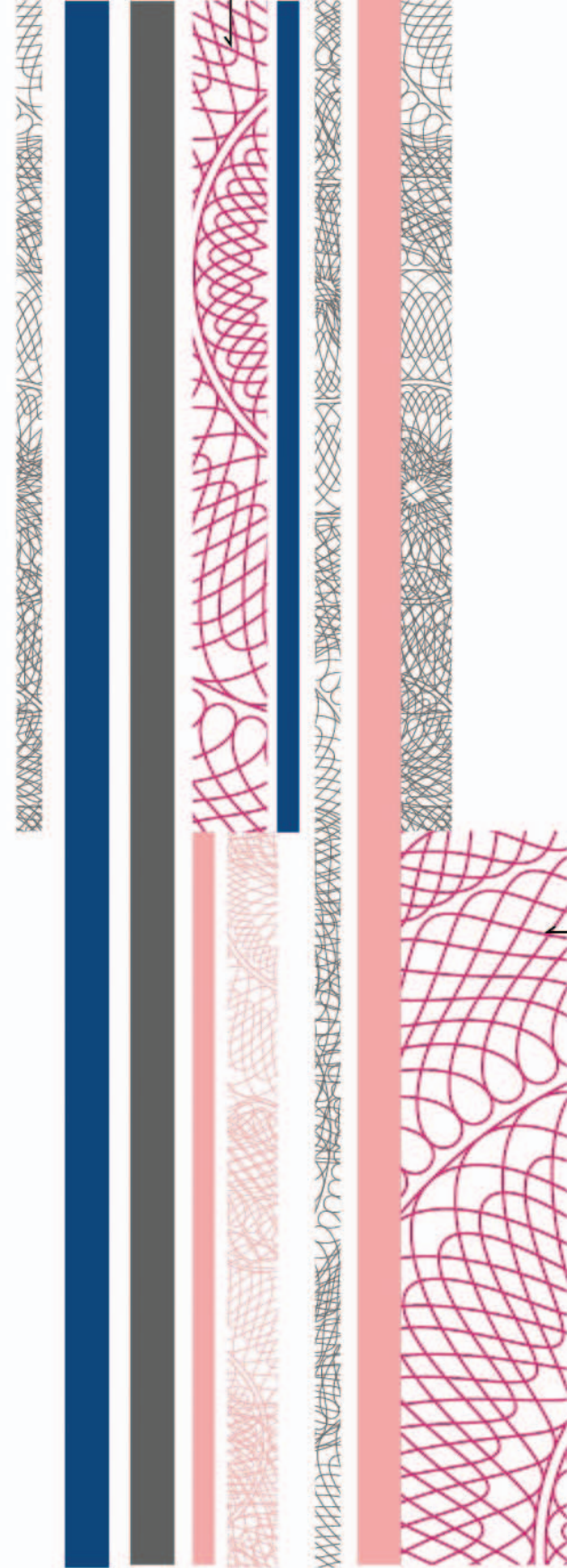




BANK OF THAILAND

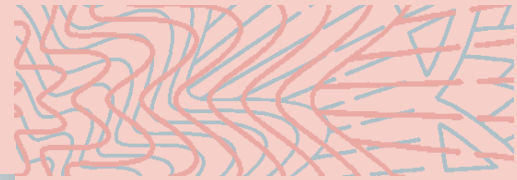


PAYMENT SYSTEMS REPORT 2011

Payment Systems 2011



June 2012



Key payment statistics in 2011

Total population	64.1 million
Nominal Gross Domestic Product (GDP)	10,539.4 billion baht

Technological Infrastructure

Number of fixed-line telephone subscribers per 100 people	10
Number of mobile phone subscribers per 100 people	122

Payment Statistics

Number of Thai commercial banks 16 with	6,183 branches
Number of foreign commercial banks 15 with	18 branches
Number of Specialized Financial Institutions branches	2,240 branches
Number of post office branches	1,295 branches
Number of Automated Teller Machines (ATM)	47,759 terminals
Number of EFTPOS machines	261,167 terminals
Number of credit cards	15,328,291 cards
Number of debit cards	38,733,246 cards
Number of ATM cards	23,756,810 cards
Currency in circulation per capita as of 31 December 2011	16,168 baht per capita
Average cheque usage per capita ¹	2 cheques per capita per year
Monthly average value of credit card payments ²	4,011 baht per credit card
Monthly average value of cash withdrawals via ATM card	7,711 baht per ATM card
Monthly average value of debit card payments ³	181 baht per debit card
Monthly average value of cash withdrawals via debit card	9,531 baht per debit card

¹ Average cheque usage per capita includes both inter-bank and intra-bank cheques

² Refers only to payments for goods and services through EFTPOS within and outside Thailand using domestically issued credit cards

³ Refers only to payments for goods and services through EFTPOS within and outside Thailand using domestically issued debit cards

Message from the Chairman of the Payment Systems Committee

The Bank of Thailand (BOT) has a mission to promote economic and financial stability together with sustainable and inclusive growth, which will help foster the strength of Thailand's economy in order to bring the country to achieve its goal of "sustainable economic well-being".

The BOT and its Payment Systems Committee (PSC) recognize that stable and efficient payment systems are crucial in supporting the aforementioned mission. In the past year, the BOT defined domestic and cross-border payment systems development as one of its five-year strategic objectives. In addition, the BOT in cooperation with representatives from all concerned parties including government, business, and banking sectors as well as academic, also formulated a Payment Systems Roadmap 2012 - 2016. The Roadmap was endorsed by the PSC as a framework for payment systems development for the next five years. The goal of the Roadmap is to create payment systems that support efficient and safe economic transactions for both public and private sectors. The Roadmap consists of three main objectives, namely efficiency enhancement, risk reduction, and consumer protection.

To enhance efficiency, one of the key challenges is to reduce payment systems costs by promoting and developing electronic payments channels, for example debit cards and e-Money, to substitute for cash payments. The measures also include improving electronic payment systems infrastructures to support domestic electronic payment services, for example development of a local switching system, which is progressing well both in terms of system development and legal preparations. Moreover, the promotion of financial inclusion and payment services access will continuously proceed so that all groups of the population can access inclusive and safe services, especially the services via mobile phone. This channel is considered to be a convenient and highly efficient way that all consumers, both in urban and rural areas, can easily access.

With regard to the ASEAN Economic Community (AEC) in 2015, in terms of payment systems, the BOT is in the process of preparing appropriate infrastructures to support cross-border payment systems within the ASEAN countries in five areas, including cross-border trade settlement, cross-border money remittance, cross-border retail payments, cross-border capital market settlement and standards and legal preparation for cross-border payments. In these undertakings, we aim to build payment systems linkage among ASEAN countries in order to support efficient intra-regional trade and investment.

The next objective is payment systems risk reduction. This encompasses developing risk management mechanisms to handle foreign exchange settlements, establishing risk management measures to deal with multilateral netting in the BAHTNET system, and setting up standards for payment cards e.g. ATM and debit cards, in order to ensure card usage security.

Consumer protection is also another area which the BOT pays attention to. Here, we aim to promote knowledge and understanding among users about the costs associated with cash transactions and the benefits of electronic payments in terms of efficiency, convenience and safety in order to strengthen consumer confidence and promote greater use of electronic payments.

In addition, in the previous year, the PSC also endorsed the development of the Imaged Cheque Clearing and Archive System (ICAS). In this connection, the PSC considered rules, regulations, practices, processes, contingency plans as well as appropriate media to promote common understandings. Such actions allowed ICAS to be launched in Bangkok and vicinity areas on 3 February 2012. Moreover, the BOT will closely monitor the expansion plan to ensure that the service will be available throughout the country by 2013.

The devastating flood in the past year caused major losses to Thai businesses and households. However, the BOT was able to support the continuous functioning of financial institutions and payment systems, for example cheque clearing, BAHTNET, ATM and inter-bank transfers. In this regard, the BOT strived to ensure availability of access to customers, as well as supported the ongoing economic activities except for some bank branches and ATMs in the flooded areas that had to temporarily suspend services. In addition, banks also helped affected customers in various ways such as granting fee exemption on inter-provincial or inter-bank ATM withdrawals to alleviate the burden of customer who had to relocate and could not access ATMs services in the flooded areas.

The success and progress of Thailand's payment systems development towards the achievement of the stated objectives rest upon the cooperation between all concerned parties. Their dedications are crucial to support and drive various projects forward as planned. As the Chairman of the PSC, I would like to thank members of the PSC, members of the Working Committees, and all involved parties for their continuous support. I hope that the cooperation from all parties will drive the development of Thailand's payment systems towards the appropriate direction and create value for individuals and business sectors in a sustainable and inclusive way ultimately.

Prasarn Trairatvorakul

(Mr. Prasarn Trairatvorakul)

Chairman of the Payment Systems Committee

29 June 2012

The Payment Systems Committee (PSC)



Chairman

Mr. Prasarn Trairatvorakul
Governor



Vice Chairman

Mr. Krirk Vanikkul
Deputy Governor
Financial Institutions Stability

Responsibilities of the Payment Systems Committee (PSC)

Section 17 of the Bank of Thailand Act mandates the establishment of a Payment Systems Committee (PSC) for formulating the policies and monitoring the implementation of the policies on payment systems under the supervision of the BOT, and on inter-bank clearing and settlement systems.



Mr. Sorasit Soontornkes
Deputy Governor
Corporate Support Services and
Banknote Management



Mr. Chatsiri Soponpanich
Chairman
The Thai Bankers' Association

Committee Members



Mr. Somkiat Anurath
Vice Chairman
Thai Chamber of Commerce



Miss Suthirat Ratanachote
Advisor
Financial and Fiscal System Development
The Comptroller General's Department



Mrs. Saowanee Suwannacheep
Commissioner
Electronic Transactions Commission
Secretary



Secretary

Mrs. Tongurai Limpiti
Assistant Governor
Financial Institutions Policy Group

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1. Payment systems policy and oversight in 2011

In 2011, the PSC stipulated payment systems policies and monitored the progress on Thailand's payment systems as follows.

1.1 Payment Systems Roadmap 2012-2016

The PSC endorsed the Payment Systems Roadmap 2012-2016 together with implementation plans on 4 November 2011. The Roadmap will be used as a framework for Thailand's payment systems developing during 2012-2016 with the aim of establishing payment systems that are efficient, sound and safe, as well as comply with international standards. Concerned agencies both public and private were communicated with regarding the direction of the Roadmap so that they can devise business plans accordingly.

The Payment Systems Roadmap 2012-2016 comprises of three main objectives, namely efficiency enhancement, risk reduction and consumer protection. The Roadmap consists of six key projects, including:

- Promotion and development of electronic payments
- Promotion of payment systems access
- Preparation for the AEC
- Payment systems risk reduction
- Enhancement of safe ATM usage
- Consumer protection and financial literacy.

Details on the Roadmap can be found in section 2 on Future directions in payment systems development. (page 35)

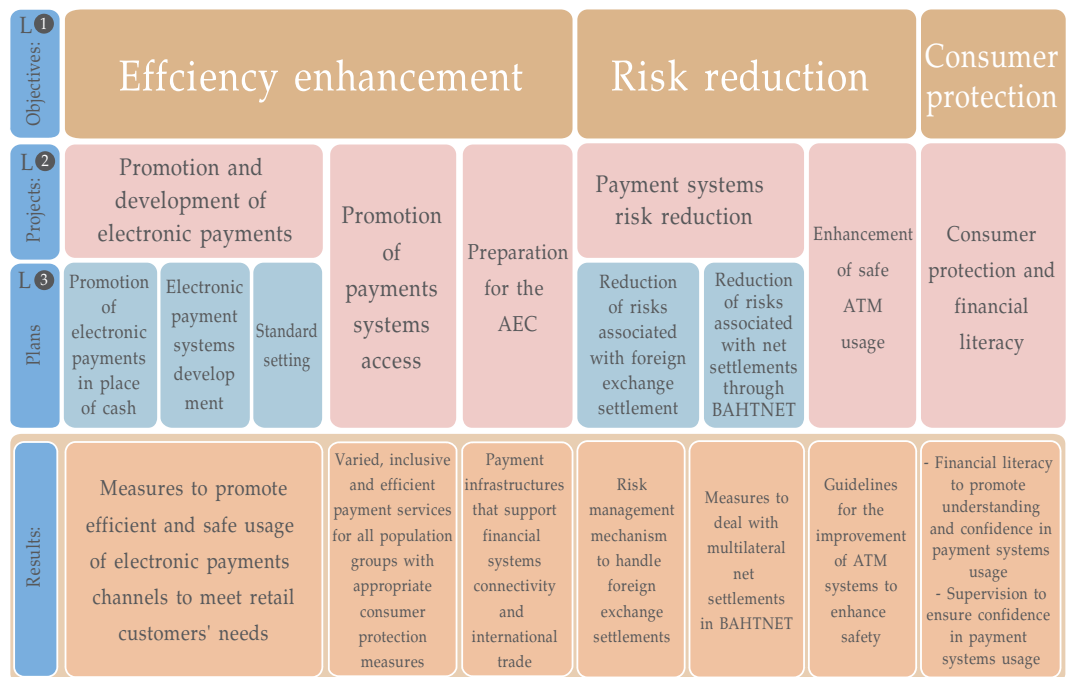
Given the five-year span of the Roadmap coupled with the fast changing payment technological advancements and environment, the PSC therefore requested an annual update



of environmental monitoring and assessment together with potential impacts on the Roadmap’s implementation. This process will allow appropriate revisions and improvements to be made so that the Roadmap can better respond to the changing circumstances.

Figure 1: Payment Systems Roadmap 2012-2016

Vision: Making payment systems support efficient, stable and safe economic activities of the public and private sectors, both domestically and internationally



Source: Bank of Thailand

1.2 Infrastructure development

In 2011, the PSC formulated measures and pushed for key infrastructure development to upgrade the country’s payment systems to achieve greater efficiency, soundness and safety, and confidence, in the following ways.

1.2.1 Development of a local switching system

The PSC approved the development of a local switching system to enhance the soundness of local payment systems especially in times of international crises that could result in suspensions of services by international switching operators. Such event can pose a major problem to the overall financial institutions system. Moreover, development of a local switching

system can also reduce costs stemming from fees paid to international operators and help promote card usage in place of cash.

The PSC therefore, delegated the BOT to discuss with banks, businesses and other related parties to formulate guidelines for the establishment of a local switching system. The guidelines shall incorporate key considerations including development of a local switching system by National ITMX Ltd., related laws, feasibility in introducing tax incentives to promote usage by retailers and card users, and publicity and knowledge creation to promote higher debit card usage. Local switching implementation in the first phase will be for domestic transactions by locally issued debit cards. The next phase will then be for credit cards.

Box 1: International local switching systems

A local switching system refers to a local system to handle data transfer and data compilation associated with domestic electronic transactions conducted through locally issued cards, including debit cards and credit cards. Countries with local switching systems include Australia, Hong Kong SAR, Korea, Japan, Singapore and Malaysia. These local switching systems are operated by the private sector.

- **EFTPOS (Electronic Funds Transfers at Point of Sale) in Australia:** is a pin-based system for locally issued debit cards that has gained wide popularity. Implementation began in 1980 by eftpos Payments Australia Limited. Contracts of usage were arranged for pairs of financial institutions, utilizing a local network to handle payments of goods and services in stores with a symbol “FATE”, for example supermarkets, retailers, petrol stations, and movie theatres. Issued debit cards have different names depending on the issuers. Users can use their cards to withdraw cash from store cashiers. However, the cards cannot be used for payments by phone or internet.
- **EPS (Easy Pay System) in Hong Kong SAR:** is a system for debit cards jointly established by 21 banks, operated by Electronic Payment Services Company (Hong Kong) Ltd. (EPSCO) that acts as a central processing centre. The company also invests in and installs card machines for participating stores and acts as an acquirer for them. EPS symbols are posted at the stores and a single machine can



be used with every member bank cards. Users can also withdraw cash from store cashiers. Once the transaction is completed, funds are instantaneously deducted from the user's account but the store's account will be credited either at the end of day or the next day. EPSCO installs card machines free of charge, irrespective of business size and location. At present, there are over 25,000 locations in Hong Kong, Macau and Shenzhen.

- **EFTPOS (Electronic Funds Transfer at Point of Sale) in Korea:** is a pin-based system for locally issued debit cards. Implementation began in 1996. Data compilation is done through Korea Financial Telecommunications and Clearing Institute's EFTPOS network. However, due to the limited locations and usage time (8.00-23.00 hrs) these debit cards are not as popular as the signature-based type issued by credit card companies, which utilizes the credit card network.
- **J-Debit in Japan:** is a system for locally issued debit cards. Implementation began in 1998 but card issuing actually started in 2000. The Japan Debit Card Promotion Association (JDCPA) is the system's owner. Members include issuers of approximately 1,600 cash card types, totaling around 390,000,000 cards. There are 250,000 store locations country-wide. However, the service is unavailable at night. The system will be developed further to include credit card and e-money services in the future.
- **NETS EFTPOS in Singapore:** is a pin-based system for debit cards. Implementation began in 1985 by NETS (Network for Electronic Transfer Pte Ltd), which is owned by a group of large banks namely DBS Bank, OCBC Bank, and United Overseas Bank (UOB). NETS acts as network provider and is the largest merchant acquirer in Singapore. There are over 60,000 locations country-wide.
- **e-Debit in Malaysia:** is a pin-based system for debit cards issued by Malaysian banks. Implementation began in 2002 by Malaysia Electronic Payment System (MEPS), which is owned by local banks. There are currently 20 member banks and the system handles around 26.3 million debit cards.

1.2.2 National payment message standard

Given that payment transactions of different businesses and financial institutions currently require different formats and transaction data, resulting in duplication of information preparation and effort, the PSC thus agreed on the development of the National Payment Message Standard to improve the convenience in exchange of payment information between businesses and financial institutions. The standard will be in line with ISO 20022 and is expected to help reduce data preparation burden for businesses and banks as well as improve convenience for users.

In 2011, the BOT together with NECTEC, commercial banks, public authorities and a number of large businesses, formulated a plan to implement a pilot project for usage of the National Payment Message Standard for the exchange of payment information. In addition, the BOT cooperated with the Customs Department to use the Standard in the National Single Window project, which aims at improving the convenience for businesses in terms of electronic data connectivity with various agencies involved in the import-export of goods. The effort will facilitate electronic checking of permits and certificates necessary for the release of goods. The BOT also coordinated with concerned agencies to set up a Committee to review the draft Standard and implement the final version once approved by relevant public authorities.



Box 2: ISO 20022

ISO (International Organization for Standardization) is a network of Non-Government Organizations (NGOs), responsible for the development and setting of various international standards concerning the business and manufacturing sectors. At the moment, there are representatives from 164 countries involved, with a headquarter in Geneva, Switzerland. ISO set up TC68 (Technical Committee 68) as Committee responsible for the supervision of various standards concerning the business and banking sectors, including ISO 20022. The representative from Thailand is the Thai Industrial Standards Institute.

ISO 20022 is a process in setting standards for messages relating to finance in five categories, namely payments, securities, foreign exchange: FX, trade services, and cards and related retail financial services. At present, there are 15 agencies involved in the development of ISO 20022 whereby over 260 message standards have been set.



1.2.3 Payment Finality

The PSC agreed on the drafting of the Payment and Settlement through Systemically Important System Act B.E The objective of the Act is to establish a law to support payment finality of payment orders executed through a systemically important payment system and to allow for non-enforcement of the Zero Hour Rule (Details in Box 3). In other words, the objective is to ensure that such payment orders are considered final, irrevocable, irreversible, unchangeable and unstoppable even under circumstances where an insolvency or bankruptcy is declared upon the payer. The Act will help prevent a systemic impact on the payment system, ensure that the main payment infrastructure of the country, for example, the BAHTNET, is in line with international standards, as well as prepare for future network connectivity with other countries.

The draft Act was approved by the PSC in 2011, and the BOT has already submitted it to the Ministry of Finance for approval and enactment.

Box 3: Non-enforcement of the Zero Hour Rule

Zero Hour Rule is a provision in the insolvency laws of some countries. In an event that a bankruptcy is declared upon a financial institution, its effect shall begin on the first second of the day the order was given. The result is that any legal undertakings that have taken place after midnight on the date the institution is ordered closed retroactively rendered ineffective. For the payment system, this implies that any legal transaction that has been carried out and completed from midnight to the time that the Court order is made will be revoked. This potentially creates a systemic risk. Therefore, a law should be defined to clearly make an exception from the Zero Hour Rule for transactions that are conducted via a systemically important payment system.

For Thailand, the BOT sent a letter to the Office of the Council of State dated 20 July 2006, requesting an opinion on the existence of a Zero Hour Rule in the Thai Bankruptcy Act in order to prepare for the participation in the Reports on the Observance of Standards and Codes (ROSC) and the Financial Sector Assessment Program (FSAP). In the case that such a rule applies to the payment system, for example, the BAHTNET, it may be considered a threat of systemic risk and payment systems stability.

The Office of the Council of State sent their opinion back in October 2006, stating that the Bankruptcy Act does not clearly define the beginning time of bankruptcy. Therefore, the Office deemed that a Court order shall take effect from the moment the order is made forward, and not backward to include the beginning hours of that day.

Nevertheless, in 2007, experts from the International Monetary Fund (IMF) who were assessors of the BAHTNET's compliance with the BIS Core Principles for Systemically Important Payment Systems as part of FSAP, viewed that the BAHTNET system and BAHTNET transactions broadly observe the guidelines. However, there is not enough clarity to assure that an insolvent participant's transaction cannot be revoked. In this connection, the mission team recommended that a law that exempts the Zero Hour Rule and ensures Payment Finality should be drafted to ascertain that completed payment or settlement orders are final, irrevocable, irreversible, unchangeable and unstoppable even under circumstances where an insolvency or bankruptcy is declared upon the payer. Such a law will help prevent systemic risk.

1.2.4 Restructuring of payment systems fees and charges

In 2011, the BOT and the Thai Banker's Association restructured payment systems fees and charges as part of the Payment Systems Roadmap 2010. The changes aim at promoting electronic payments with details appearing in Table 1.

Table 1: Summary of the restructuring of payment systems fees and charges by the Thai Banker's Association and the Bank of Thailand

Current fees	New fees	Effective date
1. NITMX Bulk Payment Credit Next Day <ul style="list-style-type: none"> • < 100,000 baht charged at 12 baht • > 100,000 - 500,000 baht charged at 40 baht • > 500,000 - 2,000,000 baht charged at 100 baht 	A single fee not exceeding 12 baht/transaction (Maximum transfer of 2,000,000 baht/transaction)	15 December 2010



Current fees	New fees	Effective date
2. Inter-provincial in-house transfers Most banks charge 10 baht for each 10,000 baht transferred (minimum 10 baht and maximum 1,000 baht) + service charge of 10 baht	Free once a month and 15 baht/transaction onwards	By 31 March 2011
3. Inter-provincial in-house withdrawals Most banks charge 10 bath for each 10,000 baht withdrawn (minimum 10 baht and maximum 1,000 baht) + service charge of 10 baht	Not exceeding 15 baht/transaction	By 31 March 2011
4. Intra-provincial inter-bank withdrawals and balance enquiries via ATMs <u>Bangkok</u> • Free 4 times/month and not exceeding 5 baht/transaction for the 5th time onwards <u>Outside Bangkok</u> • Minimum of 20-25 baht/transaction and an additional charge not exceeding 5 baht/transaction for the 5th time onwards	Free 4 times/month and an additional charge of not exceeding 10 baht/transaction for the 5th time onwards* Same rate nation-wide	By 30 June 2011
5. Inter-provincial inter-bank withdrawals via ATMs Most banks charge 10 baht for each 10,000 baht withdrawn, minimum 20-25 baht/transaction, and an additional charge not exceeding 5 baht/transaction for the 5 th time onwards	Not exceeding 20 baht/transaction and an additional charge not exceeding 10 baht/transaction for the 5 th time onwards*	By 30 June 2011

The above adjustments helped reduce costs for users and allowed businesses greater use of electronic payments instead of cheques. This was reflected from a significant increase in the volume of transactions particularly for the Thai Securities Depository Co. Ltd. that used to make dividend payment by cheques because the NITMX Bulk Payment - Credit Next Day fees were higher than those for cheque payment. Since the restructuring in 2010, the company has been increasingly relying on NITMX Bulk Payment.

* The additional charge not exceeding 10 baht/transaction for the 5th time onwards for 4 and 5 will count the total number of inter-bank withdrawals/transfers via ATMs for intra-provincial usage (4) and inter-provincial usage (5).

1.3 Payment systems services operated by BOT

1.3.1 Bank of Thailand Automated High-value Transfer Network (BAHTNET)

BAHTNET is a high-value transfer network for inter-bank Real Time Gross Settlement (RTGS). Developed and operated by the BOT in 1995, BAHTNET helps reduce inter-institutional settlement risks and offers fast and safe payment services. Major services provided by BAHTNET include inter-bank transfers, third-person transfers, and inter-bank messaging services.



The BOT's progress on BATHNET operations in 2011 were as follows.

1) Securities Requirement for Settlement: SRS

SRS is a risk prevention measure that requires financial institutions to hold debt securities approved by the BOT as collateral for a net settlement transaction.⁴ This helps reduce settlement risk where one institution's failure to pay can affect liquidity conditions of other institutions, thereby creating a systemic risk. (For settlement risk management principles, see Box 4.)

In 2011, the BOT set up a Working Committee consisting of representatives from the BOT, the Thai Bankers' Association, the Association of International Banks, and Specialized Financial Institutions to consider the appropriate SRS ratio and guidelines with the aim to minimize compliance burden on member institutions. The Committee will submit their recommendations to the PSC for approval later on.

2) Intraday Liquidity Facilities: ILF

ILF is a mechanism to help BAHTNET members manage their intraday liquidity for settlement requirements. Members can sell debt securities to the BOT with a repurchase agreement at end of day and the BOT will credit their accounts whereby the funds can thus be used for BAHTNET settlement. The amount of credit depends on the



⁴ A net settlement refers to an inter-bank settlement between members. A member's payable amounts to other members are net before actual payment is made. The final payable amounts between members are thus less than the sum of individual transactions. Examples of Thailand's net settlement systems include inter-bank cheque clearing and inter-bank ATM withdrawals and transfers.



securities' value. The BOT shall not charge a fee for such service except when the fund is required overnight. In that case, the interest charge will be the 14-day repo rate of the previous working day plus 0.5 percent per annum.

In 2011, the BOT stipulated guidelines for liquidity facilities to be used in an event that the BOT announces an emergency bank holiday period lasting more than one working day, which may result in higher liquidity needs for financial institutions to support customers' cash withdrawals. In this regard, the BOT shall proceed as follows.

- On the first day of an emergency bank holiday period, the BOT shall open the BAHTNET and Banknote Ordering System (BOS) so that financial institutions can manage their cash requirements through BOS.
- Financial institutions can use the ILF debt securities as collaterals for borrowings from the BOT in accordance with Section 41⁵ of the Bank of Thailand Act B.E. 2485, amended by the Bank of Thailand Act (Number 4) B.E. 2551.

Box 4: Settlement Risk Management

The Bank for International Settlement (BIS) Core Principles for Systemically Important Payment Systems is an international standard for risk management of systemically important payment systems. To achieve efficiency and safety, the standard consists of ten principles. The fifth principle states that risk management guidelines should be established for a multilateral net settlement to ensure timely completion of payment, even in an event of an inability to settle by the participant with the largest single settlement obligation. The guidelines can be divided into three measures.

⁵ Section 41 stipulates that with respect to the acting as the banker to financial institutions, the BOT shall have powers and duties as follows;

- (1) granting loans to financial institutions with maturity not exceeding 6 months with first-rate collateral assets as prescribed by the BOT under Section 33 (7), in accordance with the rules and conditions specified by the BOT;
- (2) being a custodian of monies, securities or other articles of value of financial institutions; including the collection of proceeds, whether principal or interest, of any such securities;
- (3) ordering any financial institutions to submit a report concerning assets, liabilities, contingent liabilities as prescribed by the BOT and may require any financial institution to explain or clarify such report. The granting of loans in paragraph one shall include the purchase with a right to sell back transaction of first-rate collateral assets under Section 33 (7) from the financial institution.

1. Defaulters Pay

Each member institution shall be responsible for their failure to settle payment whereby their pledged collateral is used for settlement, thus allowing the payment system to continue operating. In practice, highly liquid collateral such as bonds can be used.

2. Survivors Pay

In an event where a member institution fails to make settlement, the remaining members (survivors) shall be jointly liable for the unsettled amount in order to ensure timely completion of payment. The arrangement is called Loss-sharing Arrangement.

3. Third Parties Pay

A non-member institution shall be responsible for unsettled payment. In general, this non-member refers to the central bank, given its duty as lender of last resort.

(Source: Real-time Gross Settlement Systems, BIS, March 1997)

1.3.2 Imaged Cheque Clearing and Archive System: ICAS

The BOT introduced the Imaged Cheque Clearing and Archive System (ICAS) to replace the current inter-bank clearing process, reduce country-wide collection time to one day, increase cheque presentation time, reduce risks associating with physical transportation, and improve efficiency by using an image of a cheque for clearing.

In 2011, the BOT and member banks jointly developed and tested the system as well as formulated rules, regulations, guidelines and emergency procedures. The BOT has also been closely monitoring progress of member banks to ensure implementation readiness by all members. Moreover, the BOT has been promoting the system among businesses, the general public, and legal personnel to ensure their correct understanding and confidence of the system.

The BOT began using ICAS in Bangkok and vicinities on 3 February 2012 and anticipated that coverage will be expanded nation-wide in 2013.



Box 5: Safeguarding ICAS

Security measures for safeguarding ICAS and ensure users' confidence include:

- **Cheque security**

The BOT improved the cheque standard by developing an ICAS watermark to prevent forgery and assist verification. The body of a cheque is also made with paper that is coated with a special chemical, which will cause a visible mark if a scratch is made to amend the text.

- **ICAS security**

A Hash technology⁶ is used for data verification in ICAS to identify whether an amendment is made during data communication and ensure completeness. An electronic signature is also used to identify the sender.

- **Cheque image security during inter-bank data transfer**

A encryption by Public Key Infrastructure (PKI) technology is used so that only authorized persons can decrypt the message. This security measure ensures that no amendment is possible during data communication.

- **Cheque verification**

In addition to using equipments and cheque scanners, together with making necessary data preparation, member banks shall divide the responsibility in cheque verification as follows. When a customer presents a cheque for collection at a bank, it shall verify any forgery and amendment through various technologies before scanning the cheque and sending the image to the paying bank. Examples of such technologies include backlight and ICAS watermark verification. The paying bank upon receiving the cheque image shall then verify the adequacy of funds in the payer's account, their signatures, and other details against the bank's records before approving the payment.

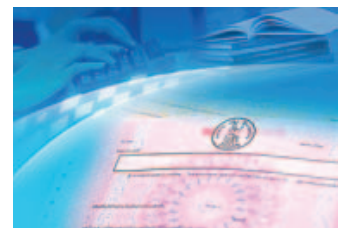


⁶ Data is processed by an algorithm to produce a Hash value which can be used to verify its correctness. The sender sends data together with a Hash value to the receiver who then feeds the data into the algorithm to produce a Hash value. If the two Hash values match, then data is original and unamended.

1.3.3 Operations during the floods in 2011

The floods at the end of 2011 adversely affected people, businesses and the provision of financial services. Nonetheless, financial institutions and payment systems, for example, cheque clearing, BAHTNET, ATM, and inter-bank transfers remained in operation.⁷ No emergency bank holidays were announced by the BOT in order to ensure ongoing financial support for economic activities. Developments were closely monitored by the BOT and consultations were held regularly with bank senior management to ensure continuous operation. In addition, financial institutions were requested to assist customers in the following ways.

- **Cash withdrawal:** The BOT requested that financial institutions assist one another in terms of cash management in cases where transportation proved difficult. To ensure sufficient cash to meet public demand, the BOT stood ready to support our cash centres in delivering cash to financial institutions.
- **Payment services:** The BOT, financial institutions, and inter-bank transfer service providers such as NITMX rehearsed various emergency procedures including system and staff relocations to an alternative site, as well as measures to allow for continuous operation of inter-bank settlement.
- **Customer care:** The BOT asked financial institutions to take appropriate steps to assist their customers. Subsequently, many measures were introduced by financial institutions including a waiver of inter-provincial or inter-bank ATM fees to support customers who had to relocate from affected areas and those who could not access their banks' ATMs, a temporary debt moratorium, and an increase in credit line to support business reconstruction or damage repairs.



1.4 Cross-border linkages

In 2011, the BOT together with stakeholders within and outside, for example, CLS Bank, legal, consultants and the ASEAN Working Committee on Payment Systems undertook a



⁷ The total number of bank branches that were closed due to the floods was 556 or 9.3 percent of the total number of branches nation-wide. 4,943 ATMs were affected, which was equivalent to 11.9 percent of the total number of ATMs nation-wide. (data as of 4 November 2011)



study on appropriate plans for cross-border linkages and risk management to aid the increasing number of cross-border transactions following the intensifying globalization and Thailand's move towards the AEC.

1.4.1 Payment systems development to support the AEC

The Committee on Payment and Settlement System: WC-PSS presented a report on the current payment systems landscape and a framework to develop regional payment systems in five key areas, namely:

- 1) Cross-border trade settlement
- 2) Cross-border money remittance
- 3) Cross-border retail payments
- 4) Cross-border capital market settlement
- 5) Standardization

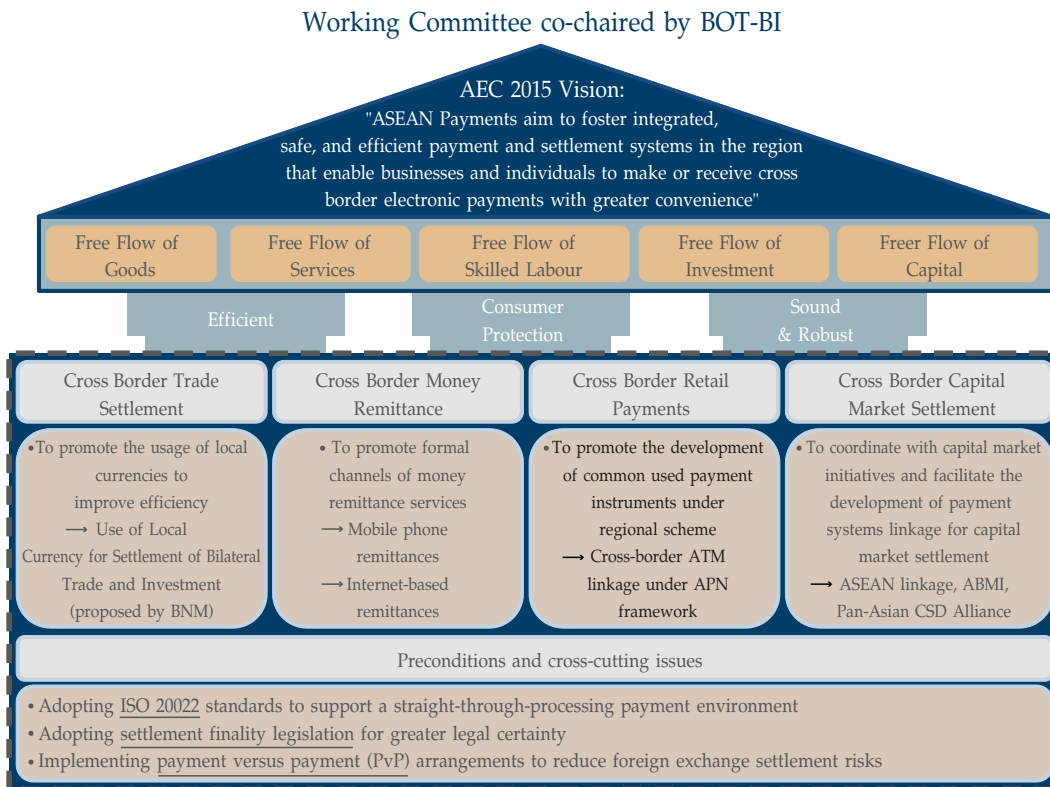
The WC-PSS reported their findings for approval at the ASEAN Central Bank Governors' Meeting (ACGM) in April 2011. The strategic framework presented was jointly agreed to by member countries and will be referenced in future cross-border payment systems development. However, implementation is subjected to readiness and bilateral arrangements. In this regard, knowledge sharing between peers will be promoted in order to enhance capacity building through various methods such as workshops, internship and study visits.

Moreover, Task Forces under the WC-PSS were established to oversee implementation of the five regional development plans. The Task Forces are currently in the process of drafting project scope and plan as well as inviting participation from private stakeholders.

The WC-PSS also published their report titled "ASEAN WC-PSS Strategic Report" on www.aseanwcpss.org where interested persons can easily follow news update.

The BOT also assessed the readiness of Thailand's infrastructures to support cross-border linkages to identify areas of improvements as well as strengths. In this regard, technical assistance to support capacity building in other member countries may be considered to help equalize regional infrastructures in order to support cross-border linkages.

Figure 2: Strategic framework for cooperation on payment systems of the ASEAN community



Source: Working Committee on Payment and Settlement

Box 6: The Working Committee on Payment and Settlement System: WC-PSS

At the 9th ASEAN Leaders' Meeting in Bali, Indonesia, on 7 October 2003, Leaders endorsed and signed the Declaration of ASEAN Concord II or the Bali Concord II, which included the formation of the AEC. Subsequently, at the Meeting in January 2007, Leaders agreed to expedite the move towards AEC from 2020 to 2015.

Moreover, to support the economic integration under AEC 2015, at the 6th ASEAN Central Bank Governors' Meeting (ACGM) in April 2010, Governors approved the set up of a Working Committee on Payment and Settlement System: WC-PSS under the purview of ASEAN⁸ central banks. In this connection, Bank Indonesia together



⁸ ASEAN central banks comprise of Brunei, Indonesia, Malaysia, Philippines, Singapore, Thailand, Vietnam, Laos, Myanmar and Cambodia.

with the BOT were selected as co-chairs of the WC-PSS whose objective is to study the current payment systems landscape and propose an appropriate regional payment systems development strategy.

1.4.2 Reduction in FX settlement risk

The BOT is aware of the necessity in minimizing FX settlement risk⁹ in line with the increasing trends in economic and trade. In 2011, the value of FX transactions through BAHTNET averaged at 210 billion baht per day or equivalent to five times GDP. The BOT thus cooperated with banks to consider various ways to minimize such risks among which was the inclusion of the baht in the Continuous Linked Settlement (CLS) system in the form of Payment versus Payment (PvP).¹⁰

The BOT cooperated with CLS Bank¹¹ to assess Thailand's eligibility for membership in various areas. At present, the BOT is in the process of reviewing membership criteria before finalizing the decision to participate in the CLS or another PvP systems.

Box 7: Payment versus Payment (PvP)

At present, FX settlement in Thailand is conducted through agent banks or correspondent banks of buyers and sellers of settlement currencies. Settlements do not occur simultaneously due to time zone differences. The most settled currency is USD/BHT, which accounts for approximately 87 percent of all FX settlements, followed by JPY/BHT.

⁹ An FX settlement risk is a risk that arises from a foreign exchange transaction whereby a counterparty that is the seller of a foreign currency delivers his sold currency to the buyer but still awaits confirmation from the other counterparty the buyer, that the purchased currency will be delivered in exchange as previously agreed. In other words, an FX settlement risk is a risk that arises because deliveries of the 2 currencies occur at different times, thereby subjecting the counterparty who is the seller to an FX settlement risk because he has already delivered his currency to the buyer but still awaits a delivery from the other side. A foreign exchange risk usually occurs because of fundamental differences in the laws, deliveries across time zones, and the payment systems of each country.

¹⁰ The process of FX settlement whereby a transfer is acknowledged as complete only when delivery of the other currency or currencies has been made as agreed. Once complete, the process cannot be revoked. The matching of currency pairs is key in this process and requires Real Time Gross Settlement: RTGS of various currencies to ensure that both sides settle at the same time, thus preventing FX settlement or Herstatt risk.

¹¹ Established by the G20 group under the oversight of the Federal Reserve Bank. The objective was to provide FX settlement services through the CLS system in the form of PvP whereby 17 currencies can be used including USD, EUR, JPY, GBP, CHF, AUD, CAD, DKK, HKD, KRW, NZD, NOK, SGD, SAR, SEK, ILS and MXN.

The time zone difference gives rise to FX settlement risk. Prevention of such risk can be done by PvP settlement whereby the buying and selling institutions can be ascertained that payments will be made at the same time. The systems that can handle this type of settlement include the CLS system and the US Dollar Clearing House Automated Transfer System (USD-CHATS).

1) CLS system

CLS system was established in 1999 under Section 25A of the U.S. Federal Act with the headquarter located in New York. The system was set up to eliminate FX settlement risk and enhance liquidity management efficiency. Deliveries of currencies are designated at the same time even though the buyer and seller may be situated in different locations in a form of Payment versus Payment (PvP). In this regard, CLS Bank will open an account at the central bank in a major currency country so that transfers via the RTGS system can be used.

2) USD-CHATS

The Hong Kong Monetary Authority (HKMA) developed the U.S. Dollar Clearing House Automated Transfer System or USD-CHATS, which is a RTGS system that handles HKD and USD trades. Transfers are immediate and handled item-by-item with the Hong Kong Interbank Clearing Limited (HKCL) acting as the Clearing System Operator and the Hong Kong and Shanghai Banking Corporation Limited (HSBC) acting as the Settlement Institution. The system began operating in September 2000. Operating hours are between 09.00 - 17.30 hrs (HKT).

1.4.3 Preparation to support international trade in Yuan

Given the increasing importance of the Chinese economy in the global context coupled with China's policy to internationalize the Yuan, the BOT thus took steps to prepare the payment systems to handle the use of the Yuan for in international trade.

In this regard, the PSC agreed to the preparation plan and drafted a bilateral swap agreement with the People's Bank of China - a fundamental step to support the plan. This agreement will promote confidence among stakeholders that there will be sufficient Yuan



liquidity for international transactions. The BOT and the PBOC signed such agreement on 22nd December 2011.

As for the preparation to handle Yuan payment and investment, the BOT is in the process of considering the most appropriate measures, giving due regards to various factors such as technical capacity, demand for BHT/CHY transactions, government policies, and benefits for the overall economy.

1.5 Payment systems oversight

1.5.1 Oversight of electronic payment service providers

In 2011, the BOT conducted oversight activities pursuant to the Royal Decree Regulating Electronic Payment Service Business B.E. 2551 as follows.

- Considered the issuance of notification acknowledgements and registration acknowledgements for those wishing to be service providers under Lists A and B and reviewed the applications of List C candidates. There were one applicants for List B and 5 applicants for List C and licenses were issued to all applicants by the Electronic Transactions Commission. At the end of 2011, there were 7 service providers registered in List B and 73 service providers licensed in List C (31 commercial banks and 42 non-banks), resulting in a total of 112 licenses. There was no service provider falling under the requirements of List A.
- Cooperated with the Sub-Committee on legal infrastructures to define guidelines in considering administrative fine on service providers to be submitted to the Electronic Transactions Commission. The guidelines were approved and a Notification on the Guidelines for Administrative Fine for Electronic Payment Service Providers B.E. 2554 was issued and took effect since 29 March 2011.
- Monitored, regulated and supervised electronic payment service providers in complying with the Royal Decree Regulating Electronic Payment Service Business B.E. 2551 and related Notifications and reported findings to the Electronic Transactions Commission regularly.



In 2011 Q4, Thailand was hit by severe floods which caused operational difficulties for service providers and created obstacles in filing requests for branch closures and submitting reports and financial statements to the BOT within the required timeframe. In this regard, there was one late application for branch closure and eight late reports and financial statements for the month ending September 2011. However, due to the unforeseen nature of the event and service providers' genuine efforts in submitting all due reports by November 2011, the BOT and the Secretary to the Electronic Transactions Commission thus made a request to the Commission at its meeting on 16 December 2011 (Meeting No. 6/2554) for a relaxation of branch closure application and reporting requirements. In this regard, the Commission approved the request and extended the timeframe for the September applications and reports to 30 November 2011 for the nine service providers mentioned.

Moreover, the BOT, acting as the responsible party to ensure enforcement of the Anti-Money Laundering Act (No. 3)¹² by non-bank electronic money card service providers, cooperated with the Anti-Money Laundering Office (AMLO) in reviewing the related Ministerial Notifications. On 25 May 2011, a Memorandum of Understanding (MOU) between the BOT and AMLO regarding the oversight of Anti-Money Laundering and Countering Financing of Terrorism: AML/CFT was also signed.

Box 8: Oversight of electronic payment service providers

Oversight of electronic payment service providers by the BOT was initially governed by the Financial Institutions Business Act because e-banking and credit card service providers were only financial institutions back then. However, with the increasing participation of non-banks, the Ministry of Finance then entrusted the BOT to supervise such non-banks according to Notification of the Revolution Council No. 58.

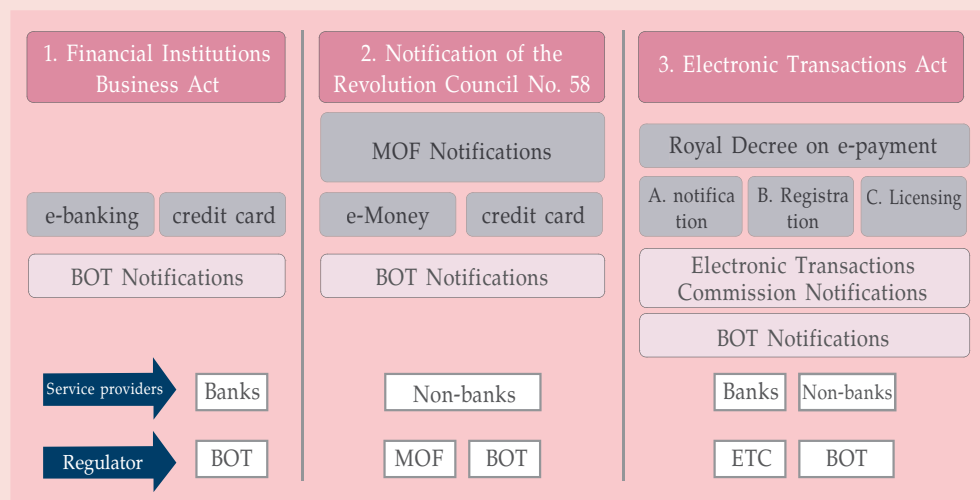
Nevertheless, because electronic transactions require highly complex and varied technology, constitute a significant portion of economic value, and expand rapidly,



¹² The Anti-Money Laundering Act (No. 3) that became effective on 19 November 2009 stipulates that e-Money service providers classified as non-bank according to the Ministry of Finance's Notification concerning the Business of Electronic Money Card and E-payment Service Providers pursuant to the Royal Decree on Regulating Electronic Payment Service Business, are required to comply with the Act as well as relating Ministerial rules and regulations. For example, they shall be required to report transactions to the Anti-Money Laundering Office, comply with Know Your Customer (KYC) requirements, and conduct Customer Due Diligence (CDD).



the Electronic Transactions Act B.E. 2544 was later enacted. The Electronic Transactions Commission was also established whereby one of its duties is to promote the reliability and legality of electronic transactions. Subsequently, the Royal Decree Regulating Electronic Payment Service Business B.E. 2551 was issued, granting the BOT with the power to supervise e-payment businesses of banks and non-banks. This effort was to ensure stability in finance and trade, promote confidence and acceptance of electronic data systems, and prevent losses to the public at large.



A summary of BOT’s legal power to regulate and supervise e-payment businesses is as follows.

- 1) The Financial Institutions Business Act B.E. 2551 allows the BOT to issue guidelines on e-banking whereby any new technology introduced by banks must be authorized in principle by the BOT. The Act also grants the BOT the power to issue guidelines on internet banking, e-Money, electronic transfers, and credit card services e.g. approval, limit setting, and risk management.
- 2) The Notification of the Revolution Council No. 58 grants the Ministry of Finance with the power to issue the Ministerial Notification on Business that Requires a Permit According to Section 5 of the Notification of the Revolution Council No. 58, which sets the guidelines for the establishment, licensing, and conditions for credit card and e-Money businesses. Non-bank service providers whose businesses are considered bank-like in nature must be approved by the MOF.

The BOT is entrusted with the responsibility to supervise such businesses and can issue guidelines and conditions for credit card and e-money service providers e.g. advance cash management, fees, complaint handling, and accounting.

3) **The Electronic Transactions Act B.E. 2544 (2001)** stipulates the issuance of the Royal Decree Regulating Electronic Payment Services B.E. 2551 (2008) with the aim to preserve stability in finance and trade, promote confidence and acceptance in electronic data system, and prevent loss to the public at large. The Electronic Transactions Commission is granted with the power to issue the Notification of the Electronic Transactions Commission Re: Requirements, Procedures, and Conditions for Undertaking Electronic Payment Service Business B.E. 2552. Oversight activities are entrusted to the BOT whereby it can issue additional guidelines as appropriate. Eight types of businesses fall into the scope of this Act whereby supervisory standards vary according to the nature and level of risk.

- (1) **Businesses that are required to make notification to the BOT** (List A) include the provision of e-Money services to be used to purchase specific goods and services that are previously determined from a single provider. An exception is made in the case where the use is limited to providing convenience to customers without a profit-making objective, as announced by the BOT and endorsed by the Electronic Transactions Commission.
- (2) **Businesses that are required to make registration with the BOT** (List B) include credit card network, EDC network, switching service through a particular system, and e-Money services to be used to purchase specific goods and services that are previously determined from many providers at the outlets which are part of the same sales and distributions system.
- (3) **Businesses that are required to acquire licenses before providing services** (List C) includes account debit, settlement service, electronic payment service through a particular instrument or a network, switching service through many systems, payment agent, and e-Money services to be used to purchase specific goods and services that are previously determined from many providers with no restrictions on outlets and sales and distributions systems.



The BOT shall consider the issuance of notification acknowledgements and registration acknowledgements for those wishing to be service providers under Lists A and B. For List C applicants, licenses shall be issued by the Electronic Transactions Commission upon the BOT's recommendation. Moreover, service providers wishing to undertake e-Money multi-purpose businesses must submit an additional application for license to the Ministry of Finance through the BOT.

Number of service providers in each category under the Royal Decree
Regulating Electronic Payment Service Business
(as of 31 December 2011)

Business category	Number
List A	None
List B	
- Credit card network	None
- EDC network	None
- Switching service through a particular system	2
- E-Money services to be used to purchase specific goods and services that are previously determined from many providers at the outlets which are part of the same sales and distributions system	5
List C	
- Account debit	3
- Settlement service	3
- Electronic payment service through a particular instrument or a network	55
- Switching service through many systems	2
- Payment agent	33
- E-Money services to be used to purchase specific goods and services that are previously determined from many providers with no restrictions on outlets and sales and distributions systems	15

For name of service providers, please visit the BOT's website:

(<http://www.bot.or.th/Thai/PaymentSystems/OversightOfEmoney/ListOfEmoney/Pages/eMoneyProvider.aspx>.)eMoneyProvider.aspx)

1.6 Payment systems data dissemination

The BOT compiled and disseminate important data on the payment systems operated by the BOT and other institutions for the benefit of related agencies and the public. Dissemination is via the Annual Reports and the BOT's website, providing in-depth data to meet users' needs at their convenience. The BOT also improved the frequency of various data on the website, including data on the volume and value of payment transactions through various systems and channels as well as other related data.



Payment systems data published on the BOT website in 2011 include:

1) Payment systems statistics

<http://www.bot.or.th/Thai/Statistics/PaymentSystems/Pages/StatPaymentTransactions.aspx>

Include statistics on the volume and value of payment transactions through various systems and channels, for example, credit cards, debit cards, ATM cards, ATM terminals, Electronic Fund Transfer at Point of Sales (EFTPOS) machines, and data on electronic payment service providers pursuant to the Electronic Transactions Act B.E. 2551.

2) Fees comparison table

<http://www2.bot.or.th/feerate/index.aspx>

Include information on fees and charges that banks and non-bank credit card and personal loan service providers collect for providing services such as transfers, payment, and loans. A comparison of fees is designed to assist consumers in their decision makings.

3) Payment systems multimedia

<http://www2.bot.or.th/PSServices/>

Is multimedia information on the payment systems. Its content and presentation design cater for the general public and businesses. The content is divided into two parts: (1) thirteen payment systems services in Thailand, which include information on usage, benefits, warnings and other information that users need to be aware of; and (2) supervision of e-Payment, which include important information such as the Royal Decree Regulating Electronic Payment Service Business, characteristics of businesses that must be regulated under the Royal Decree, requirements of electronic payment service providers, registration and licensing procedures, and punishment and fines in case of non-compliance.



2. Future direction in payment systems development: Payment Systems Roadmap 2012-2016

2.1 Background

The BOT set up the PSC on 27 August 2001 to formulate policies of promoting safety and efficiency in the national payment systems. The PSC has so far approved two roadmaps for the payment systems, which are the Payment Systems Roadmap 2004 and the Payment Systems Roadmap 2010. These roadmaps provided framework for developing Thailand's payment systems during 2002 - 2004 and 2005 - 2010, respectively. Major contributions that resulted from implementing projects according to the two roadmaps are as follows:

2.1.1 Payment Systems Roadmap 2004

- **The establishment of National ITMX Co., Ltd. in 2005**
The National ITMX Co., Ltd., was established from the cooperation of commercial banks. This switching center served as the main development infrastructure of interbank payment systems services. It was established in order to reduce duplicated costs in the payment systems as well as to support safety and efficiency in the payment systems linkage.
- **The push for the passing of the Royal Decree Regulating on Electronic Payment Services B.E. 2551 (2008)** The Royal Decree Regulating on Electronic Payment aimed to safeguard stability in trade and finance, strengthen confidence and acceptance of electronic data system, protect the public against losses, and promote the use of electronic payment services.
- **The setting of barcode standards for bill payment, such as electricity, water and telephone bills.**

- The development of ASEANPay Project. This project aimed to support the use of cross-border ATM within the ASEAN region.

2.1.2 Payment Systems Roadmap 2010

- The restructuring for fairness and appropriateness of payment systems fees and charges. The new payment fees structure has been in use since mid December 2010.
- The support to setup the Local Switching system. The Local Switching system is the switching system for processing electronic cards that are issued and used locally. This system reduces dependency on international switching centers and costs of financial institutions and retailers that accept such cards. This initiative has been pushed forward to setup the Local Switching system in the subsequent roadmap.
- The establishment of the National Payment Message Standard. The National Payment Message Standard was initiated for users and financial institutions to link payment information with the same standard. This standard increases convenience in carrying out financial transactions for users and reduces costs and efforts used in handling data. There has been an initiative to put into force as the National Payment Message Standard in the subsequent roadmap.



In 2011, the new Payment Systems Roadmap has been drawn up to support the continuity of development in Thailand's payment systems as well as in line with the Financial Sector Master Plan 2, technological development and the changing environment and cross-border linkages of financial transactions within the upcoming ASEAN Economic Community. The new Roadmap will be used as the framework for developing Thailand's payment systems during 2012 - 2016 focusing on efficiency, stability and safety of Thai Payment Systems and complying with international standards. The Roadmap involves the payment systems operated by the BOT and those operated by banks and non-bank as well as related legal and technological infrastructures, in order to affiliate with needs of service providers and users in all sectors, including public, private sector and consumers.

2.2. Payment Systems Roadmap 2012 - 2016

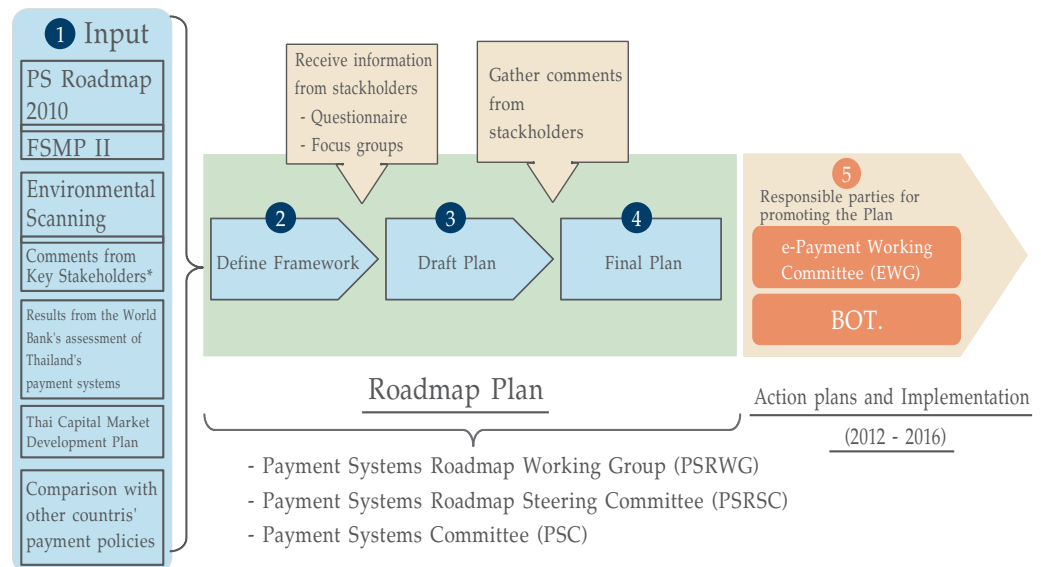
The BOT appointed 2 Task Forces to lay out the Roadmap. The first Task Force was the Payment Systems Roadmap Working Group (PSRWG) who was responsible for drafting the payment systems Roadmap. The PSRWG comprised of BOT's executives whose work was



related to the payment systems, financial institutions and legal issues. They studied, analyzed and developed the framework for the Roadmap and submitted to the second Task Force called Payment Systems Roadmap Steering Committee (PSRSC) for further approval. The PSRSC comprised of representatives from the government agencies, business, and banking sectors, independent academics, and BOT's chief executives. The PSRSC then presented the Roadmap for final approval from the PSC on 4 November 2011.

During the process of developing the Roadmap, the PSRWG evaluated input data from various sources namely the results from previous Roadmaps, internal and external environmental factors that may impact Thai payment systems in the future, payment systems development plans of other central banks, as well as the alignment with other major development plans such as the Financial Sector Master Plan 2 (2010 - 2014) and the Thai Capital Market Development Plan. The process also included in-depth brainstorming on related issues by all concerned parties, including bank and non-bank service providers, users from the public and private sectors and selected academics.

Figure 3: Payment Systems Roadmap 2012 - 2016 establishment process



* Chairman of the Thai Banks Association, President of the Stock Exchange of Thailand, and representatives from the Association of International Banks, Thai Bankers' Association, Thai Chamber of Commerce, and Thai e-Commerce Association.

Source: Bank of Thailand

2.2.1 Summary of Thailand's payment systems assessment

The PSRWG evaluated the strength and weakness of Thailand's payment systems, including external factors that will impact future developments of payment systems. The PSRWG conferred with relevant parties and conducted a comparative study of other countries' payment systems' developments to use as the basis for defining the framework for future developments of payment systems.

Results from assessing Thailand's payment systems between 2010 - 2011 can be summarized as follows:

1) Needs of Key Stakeholders

Payment systems are key mechanisms for capital mobilization in the economy and linked to all economic sectors, including service providers, users, and regulators. Consequently, the BOT evaluated the needs of stakeholders in the payment systems to ensure that the Roadmap will incorporate needs of these various groups of stakeholders, which can be summarized as follows:

- (1) **Service Providers** (banks and non-banks) need clarity on official policies which are important inputs for the efficient formulation of business plans and business undertakings.
- (2) **Service Users** (government agencies, businesses, consumers) need convenient, fast and cost efficient payment services in order to increase competitiveness as well as confidence in payment systems' security.
- (3) **Government agencies** need the BOT's policy been consistent with those of the government and other public sectors.
- (4) **The BOT** needs to be assured that the payment systems are efficient, stable and safe, and that there are appropriate levels of competition.



2) Assessment of payment systems' environment

(1) Legal infrastructure

Overall, the legal infrastructure in Thailand concerning the oversight of the payment systems and service providers is effective. That is, Thailand has legislations that provide the BOT absolute authority in oversight the payment systems, namely The Bank of Thailand Act B.E. 2485, amended by Section 3 of the Bank of Thailand Act (No. 4) B.E. 2551, and the Financial Institutions Business Act B.E. 2551. As for the regulation of electronic payments, the BOT acquires legal power pursuant to the Royal Decree Regulating on Electronic Payment Services B.E. 2551(2005) to oversee electronic payment service providers in the provision of stable, safe and credible services, as well as compliance with the laws.

However, the BAHTNET system, which is a national systemically important payment system, still has legal shortcomings that need to be further developed. Results from the assessment of Thailand's payment systems by the Financial Sector Assessment Program (FSAP) by the International Monetary Fund (IMF) in collaboration with the World Bank in 2007, and the Global Payment Systems Survey by the World Bank in 2008, stated that Thailand still did not have absolute laws regarding payment finality, and the exemption of the Zero Hour Rule for transfers and settlement via BAHTNET. This may cause payment transactions which are sent through BAHTNET to be voided in cases where participants are declared insolvent by the Court.

From the aforementioned points, Thailand mostly received an evaluation from FSAP for matters relating to the payment systems at the "Observed" level (passed all set criteria). Only matters relating to legal infrastructure and payment finality received evaluations at the "Broadly Observed" level (some issues are not consistent with the standards but are not seen as barriers in implementation). The assessments are consistent with results from the Global Payment Systems Survey, which evaluated the development of Thailand's legal infrastructure to be at the Medium-low level.

Table 2: Assessment of the BAHTNET under the FSAP

Principles	Results
1. Legal basis	Broadly Observed
2. Understanding of risks	Observed
3. Management of risks	Observed
4. Prompt final settlement	Broadly Observed
5. Netting arrangement	Not Applicable
6. Settlement assets	Observed
7. Security and Operational reliability	Observed
8. Efficiency	Observed
9. Access	Observed
10. Governance	Observed

Source: International Monetary Fund and World Bank 2007

Table 3: Assessment of legal issues under the Global Payment Systems Survey in 2008

Assessment Level	Country
High	Hong Kong, Sri Lanka, Australia, USA, UK and Canada
Medium-high	Malaysia, Indonesia and Singapore
Medium-low	Thailand, Cambodia, China, Taiwan, Japan, Fiji
Low	Philippines

Source: World Bank 2008

(2) The payment system as the infrastructure of financial system

BAHTNET is the Thai payment system which is efficient, stable safe as well as complies with international standards. The Global Payment Systems Survey evaluated the Important Payment Systems in different countries by considering two key points, which were (1) systems design and policies relating to security, and efficiency, and (2) the proportion of high-value settlements through the Real Time Gross Settlement (RTGS) System compared to the use of cheques for high-value payments.



For the first key point, the systems design and policies relating to security and efficiency. Thailand has RTGS system for high-value payments with effective measures and transparent policies to reduce credit risks, liquidity risks, and operational risks. Consequently, Thailand's system is assessed as High Development Group. For the second key point, the proportion of high value settlements through the RTGS compared to the proportion of cheque usage, Thailand's systems are assessed as Medium-High Development Group. That is, some high-value payments in Thailand are still being made by cheques.

Table 4: Assessment of design and risk prevention in high-value funds transfer system under the Global Payment Systems Survey in 2008

Assessment Level	Country
High	Thailand, Indonesia, Singapore, Taiwan and Canada
Medium-high	Malaysia, Philippines, China, USA, UK and Japan
Medium-low	No countries within the SEACEN group
Low	Cambodia and Fiji

Source: World Bank 2008

Table 5: Assessment of cheque usage in high-value funds transfer system under the Global Payment Systems Survey in 2008

Assessment Level	Country
- Do not prefer using high value cheques	Malaysia, Indonesia, Singapore,
- Value of payments through RTGS is greater than 90%	Hong Kong, Japan, Taiwan, USA, UK, Australia and Canada
- Use high value cheques, and value of payments through RTGS is greater than 75% but less than 90% of all payments	Thailand, Philippines, Sri Lanka and China

Assessment Level	Country
<ul style="list-style-type: none"> - Prefer using high value cheques - Value of payments through RTGS is less than 75% of all payments 	No countries in South East Asia
<ul style="list-style-type: none"> - Use cheques for high value payments - Do not have RTGS 	Cambodia and Fiji

Source: World Bank 2008

The aforementioned assessment concluded that although Thailand’s payment systems infrastructure can be deemed as efficient, stable and safe, there were still some matters that can be developed further to increase the efficiency and reduce risks, such as:

- Risk prevention in inter-bank settlements to reduce the risks associated with Thailand’s ongoing reliance on high-value cheques
- Efficiency enhancement in the provision of services for financial institutions to increase convenience and reduce payment costs. An example is the development of the Imaged Cheque Clearing and Archive System (ICAS)
- Development of the Business Continuity Plan (BCP) for the payment systems infrastructure such as the BAHTNET system and other inter-bank payment systems to ensure continuity of services as well as handle different types of risks that may increase, such as political unrest and natural disasters.

(3) Retail payment systems

The World Bank’s assessment stated that although Thailand has readiness concerning the payment infrastructure as it is assessed to be in the Medium-High Development Group in terms of the readiness of the payment infrastructure and payment systems policies to support efficient and safe payment services, it is evaluated as Medium-Low Development Group in terms of electronic payments usage compared to other countries.



Table 6. Assessment of payment systems infrastructure readiness and payment systems policy under the Global Payment Systems Survey in 2008

Assessment Level	Country
High	No country from the SEACEN group Australia, Canada, Japan, Germany, UK and USA
Medium-high	Thailand, Indonesia, Singapore, Taiwan, Sri Lanka, Malaysia, China and Hong Kong
Medium-low	Philippines
Low	Cambodia and Fiji

Source: World Bank 2008

Table 7. Assessment of electronic payments under the Global Payment Systems Survey in 2008

Assessment Level	Country
High	Singapore, Australia, Canada, Japan, Germany, UK and Hong Kong
Medium-high	Taiwan, Malaysia, China and USA
Medium-low	Thailand and Indonesia
Low	Cambodia, Philippines and Sri Lanka

Source: World Bank 2008

An example of electronic payments that is not widely used is debit cards. For the past several years, payments through debit cards have not yet gained popularity and they have been mainly used for cash withdrawal only. This was due to consumer behaviour, lack of knowledge and understanding in using the service, and the fact that some retailers advised customers to use cash instead of debit cards to avoid the merchant fees.

3) Factors that will impact payment systems development during 2012 - 2015

External factors that may positively and negatively impact payment systems development and business directions for service providers in the future can be summarised as follows:

- (1) The advancement of information technology and consumer behaviour that is more receptive of technology will affect forms of payment services such as the prevalence and lowered prices of high-speed Internet service (ADSL) and mobile devices, especially smart phones and tablet PCs that have been developed to offer different applications to support various activities. In addition, the availability of 3G services for mobile phones has resulted in greater convenience in making payments. These factors offer greater opportunities for businesses and consumers to utilize electronic payments, especially among the younger generation who are well acquainted with technology. Nonetheless, new forms of frauds may increase in line with technological advancement.
- (2) Uncertainties in the economic environment have led businesses to place greater importance on cost reduction and efficiency enhancement in order to maintain competitiveness. This should play a supporting factor for the business sector and service providers to utilize more electronic payments. This is because electronic payments can help reduce costs and risks in their operations, especially those relating to using cash and cheques, which incur high costs for both service providers and users.
- (3) The expansion of economic integration that brings about opportunities and new competitions, such as trade liberalization and formation of the ASEAN Economic Community in 2015, implies that formulation of policies for international payment systems linkages will be crucial in allowing trade and investment proceeding with efficiency, stability and security. Therefore, this is an important mission that needs cooperation from the public and private sectors.
- (4) The call for promoting access to payment services and consumer protection has prompted the enhancement in the role of regulators. In addition, in the case of Thailand, a large proportion of consumers and businesses still lack of knowledge and understanding of payment systems services. As a result, they



cannot make choices for payment services as efficiently as they should do. Furthermore, there is still a lack of confidence in electronic payments usage.

2.2.2 Summary of the Payment Systems Roadmap 2012 - 2016

The vision of the Payment Systems Roadmap 2012 - 2016 is to ensure that Thailand's payment systems is be an importance mechanism to facilitate efficient, stable and safe economic activities of the public and private sectors, both domestically and internationally. As such, the Roadmap covers three main objectives as follows:

1) Payment systems efficiency enhancement

The objective aims to support domestic and international money transfers and payments to be fast and convenient, have appropriate costs, and meet needs of various groups of users including the public and organizations (public sectors and private sectors). This will in turn help build the country's overall capability. The projects stemming from the Roadmap are:

- (1) **The promotion and development of electronic payments** to stimulate greater use of electronic payments instead of cash among the public. The project has the following action plans:
 - Study user's needs and behavior and related barriers as well as prepare a policy recommendation to support the promotion and development of electronic payments.
 - Develop the plan of promotion and development of electronic payments, consisting of:
 - A plan to promote and develop electronic payment services that covers service providers and various groups of users, including households and organizations (public sectors and private sectors). Examples of electronic payment services that will be promoted are card payment, debit cards and e-Money, mobile and internet payments.
 - A plan to improve and develop electronic payment systems infrastructure to support payment services in order to meet needs of various groups of users. Examples of electronic payment systems infrastructure include



switching centers, payment systems data, clearing systems, and related common standard.

Information from the earlier step such as the study of user's need and behaviour, obstacles as well as policy recommendations will be incorporated to formulate the plan.

- Implement the plan of promotion and development of electronic payments during 2012 - 2016.

The BOT has established the e-Payment Promotion Working Group (EPWG) on 15 December 2011, consisting of representatives from the BOT, the Thai Bankers' Association, the Association of International Banks, the Thai Chamber of Commerce, and the Federation of Thai Industries. The EPWG is entrusted with the task to develop a plan to promote electronic payments and to study the needs and behavior in various groups of users. The Plan and Findings from the study shall then be presented to the PSC for approval and implementation.

(2) The promotion of payment access

Aim to facilitate the public from various groups to have easy access to payment services through various channels thoroughly and efficiently, as well as ensure that necessary consumer protection mechanisms have been put in place. The payment channel with high potential access that should be put into considered is mobile payment as it offers a wide coverage to all groups of users, especially users at the grassroots level. Studies and experiences from different countries, such as the Philippines, Kenya and Mexico, have shown that mobile payment services have been successful in supporting greater accessibility to payment services for the public.

Nonetheless, because mobile payment services in different countries have different models and operations, the BOT is currently studying needs and readiness of all stakeholders, service providers and users, in order to design the suitable plan for Thailand in promoting and developing mobile payment services.



(3) The preparation for the AEC 2015

Aim to ensure that Thailand has the infrastructure to support cross-border payments of Thai business trade and investment among the ASEAN countries. In this regard, the BOT has defined the following action plans:

- Assess Thailand's readiness in five major areas of payment services which are Cross Border Trade Settlement, Cross Border Money Remittance, Cross Border Retail Payments, Cross Border Capital Market Settlement, and Standardization. Legislation readiness regarding payment finality to support payment systems linkages with other countries will also be included. Discussion will be held to gather comments from stakeholders, namely the Thai Bankers' Association, the Thai Chamber of Commerce and payment services providers.
- Propose preparation guidelines for Thailand's readiness in payment services.
- Establish the plan so that Thailand's payment systems will be ready to support the AEC in 2015.



In addition, the BOT also acts as the co-chair together with Bank Indonesia for the Working Committee on Payment and Settle Systems (WC-PSS), which has been entrusted with the role of promoting and monitoring progress according to the Payment Systems Development Roadmap in the region, and coordinate with other Working Committees under the AEC framework so that progress is made in the same direction. Moreover, the BOT will act as the main coordinator with the Central Bank of Laos in a special Working Committee regarding standardization, which is responsible for determining the guidelines for the promotion of common standard for payment transactions between countries. This also includes the promotion of knowledge creation and exchanging of experiences within ASEAN countries to strengthen payment systems development capabilities through conducting workshops, internships and study visits.

2) Risk reduction in payment systems

Risk reduction in payment systems focuses on reducing settlement risks in the financial institutions system. Activities entail defining mechanisms for managing FX settlement risks

and managing risks from multilateral net settlements through the BAHTNET. This is to reduce the chance that a failure to settle a net position by one financial institution will not create the systemic impact on other financial institutions. Moreover, emphasis is placed on defining appropriate guidelines to increase safety in ATM usage so that the services meet international standards. These activities are carried out in the following projects:

- Payment systems risk reduction

This project is to ensure that there is a procedure for managing FX settlement risk, and also to push for tools to reduce such risks, such as the PvP system, and the measure for managing risks from multilateral net settlements through the BAHTNET called “Securities Requirement for Settlement” (SRS). Such measure will help reduce inter-bank net settlement risks for transactions such inter-bank cheque clearing system, inter-bank retail bulk payments and inter-bank retail transfers through ATMs and bank counters.

- Safety enhancement for ATM usage

This project is to increase safety and confidence of customers in using ATMs, so that the services meet international standards and support the economic integration under the AEC. This includes defining standards on cards and services, consumer protection mechanisms, and putting in place a system to efficiently monitor card frauds. Service providers and various stakeholders will be consulted so that an appropriate implementation plan can be determined.



3) Consumer protection and financial literacy

This project is to help the public gain knowledge and understanding of payment services, thereby enabling them to have the ability to select appropriate services to meet their needs. This includes understanding their rights and roles, and understanding the roles of agencies that are responsible for consumer protection. Additionally, the project involves working to ensure that regulations also help ensure consumers’ confidence that payment services usage are efficient and safe.

Moreover, the PSC has assigned the BOT to monitor and assess changes in the payment systems environment that may affect the Roadmap on an annual basis. The BOT will then present findings to the PSC and provide recommendation for any revision and amendment of the Roadmap in order to appropriately align with such new developments.



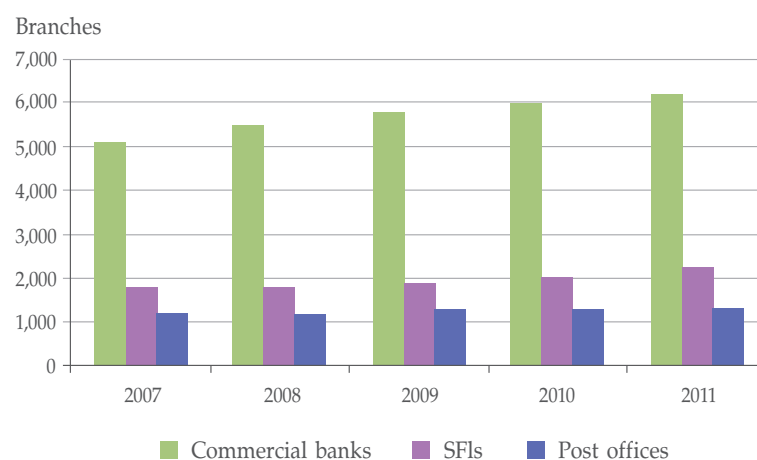
3. Data and statistics in payment systems

3.1 Payment infrastructure

Basic payment infrastructure such as branches, ATMs, Electronic Fund Transfer at Point of Sales (EFTPOS) machines, plastic cards, and fixed-line telephones and mobile phones, are important to payment systems development as they determine the level of users' convenience and access. Compared to international peers, Thailand's electronic payment infrastructure stood at roughly the same level of standards. However, the fact that usage remained lower implies that electronic payment have not yet become popular in Thailand and should be promoted further

3.1.1 Branches of commercial banks, Specialized Financial Institutions, and post offices

Figure 4: Number of branches of commercial banks, Specialized Financial Institutions and post offices



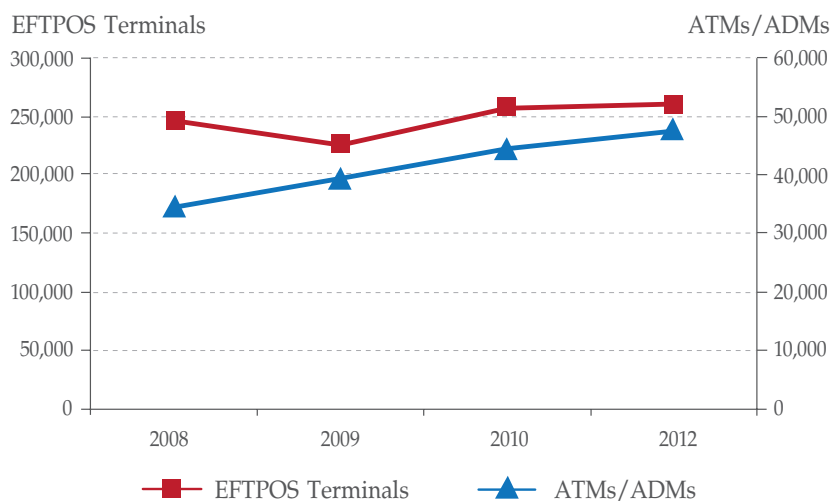
Source: Bank of Thailand

In 2011, commercial banks, SFIs and post offices continued to open more branches compared to 2010.

- Commercial bank branches stood at 6,201 branches in 2011, increasing by 3.8 percent from 5,976 branches in 2010. Of this, 6,183 branches belong to Thai commercial banks while the number of foreign bank branches is 18.
- Specialized Financial Institutions (SFIs¹³) branches stood at 2,240 branches, growing by 11.9 percent from 2,002 branches in 2010.
- Post office branches stood at 1,295, up by 1.1 percent from 1,281 branches in 2011.

3.1.2 ATM/ADM and EFTPOS terminals

Figure 5: Number of ATM, ADM and EFTPOS terminals



Source: Bank of Thailand

¹³ SFIs include the Bank for Agriculture and Agricultural Cooperatives, Government Housing Bank, Government Savings Bank, EXIM Bank, SME Bank and Islamic Bank of Thailand.



- ATM and ADM are machines that provide ease of access to users' accounts. They can handle a wide variety of transactions, for example, cash withdrawal, payment for goods and services, and cash deposit. At the end of 2011, there were 47,759 ATM/ADM terminals, up by 7.4 percent from 44,468 terminals in 2010. Such increase reflects banks' attempt to reduce operating costs associating with bank counter services.

The ratio of ATM machines per capita in Thailand is higher than in many countries. According to the Bank for International Settlements¹⁴ (BIS), in 2010, the average ratio for CPSS¹⁵ members was 324 ATM machines per 1 million persons. In Singapore, the ratio was 481 ATM machines per 1 million persons. In Thailand, the ratio as of 2011 stood at 745 ATM machines per 1 million persons. Moreover, the number of debit cards and ATM cards per bank (excluding SFIs) ATM terminal was 1,251 cards per terminal, declining from 1,260 cards per terminal in 2010. This reflects that the increase in ATM terminals was higher than issuance of cards.

- The number of EFTPOS terminals totaled at 261,167 terminals, up by 1.1 percent from 258,248 terminals registered in the previous year. The ratio of debit and credit cards per EFTPOS terminal equaled to 207 cards per terminal, increasing from the previous year's ratio of 187 cards per terminal. Thailand's number of EFTPOS terminals per population was lower than Singapore and Malaysia. In this regard, such ratio was 4,076 EFTPOS terminals per 1 million persons for Thailand, compared with 19,448 and 6,381 EFTPOS terminals per 1 million persons for Singapore and Malaysia (as of 2010), respectively.

¹⁴ Bank for International Settlements statistics on Payment and Settlement Systems in the Committee on Payment and Settlement System

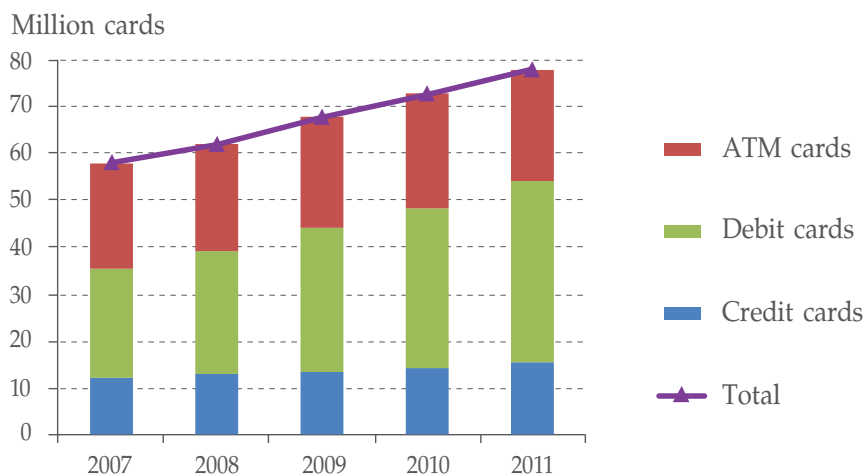
¹⁵ Committee on Payment and Settlement System refers to countries participating in the BIS Committee on Payment and Settlement System, mainly representing advanced economies from various regions. The list can be found at www.bis.org/about/factcpss.htm.

3.1.3 ATM, debit and credit cards

- The total number of ATM cards stood at 23.8 million cards, declining by 2.3 percent from 2010 where there were 24.3 million cards issued.
- The total number of debit cards stood at 38.7 million cards, increasing by 13.5 percent from 2010 where there were 34.1 cards issued.

The ratio of debit cards was highest among all plastic cards for the fifth year in a row since 2007. Meanwhile, the number of ATM cards, the second highest, continued to trend downward as commercial banks moved to market debit cards in terms of both new issues and ATM card replacements. As of 2011, there were a total of 62.5 million ATM and debit cards all together, equivalent to 0.98 cards per person. In Malaysia and Singapore, the ratios were 1.94 and 1.06 cards per person, respectively.

Figure 6: Number of credit, ATM and debit cards

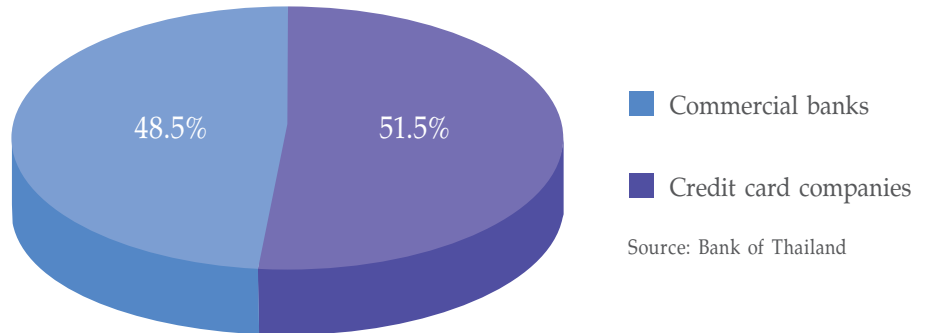


Source: Bank of Thailand

- The total number of credit cards stood at 15.3 million cards, increasing by 8.0 percent from 14.2 million cards in 2010. Of these, cards issued by commercial banks stood at 7.9 million cards while those issued by non-bank credit card companies stood at 7.4 million cards, making their proportions 51.5 percent and 48.5 percent, respectively.

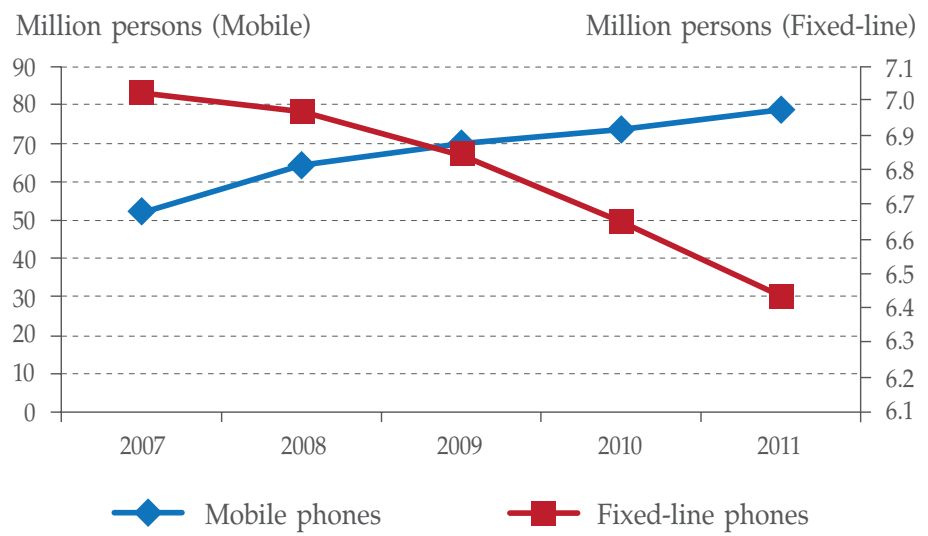


Figure 7: Composition of credit cards issued by issuer in 2011



3.1.4 Subscribers of fixed-line telephones and mobile phones

Figure 8: Number of subscribers of fixed-line phones and mobile phones



Fixed-line telephones and mobile phones represent a means to access financial and payment services through either the internet or communication networks. These access channels improve the convenience and speed of access for users, and represent important means to promote wider access, especially among grassroots population.

In 2011, the number of fixed-line telephones registrations stood at 6.4 million numbers, representing 10.0 percent of total population. This number represents a 3.3 percent, declining from 6.7 million numbers registered in the previous year. Meanwhile, the number of subscribers of mobile telephones stood at 78.4 million persons, or 122.3 percent of total population. This was an increase of 7.3 percent from the previous year - a faster rate of increase compared to that of 2010 which was 5.1 percent. This was due to the decline in prices of mobile phones and some smart phones. Most mobile phone subscribers continued to use the prepaid system.

3.2 Major channels and payment instruments

There are two types of mediums of payment (1) paper medium, for example, cash and cheque; and (2) e-Payment medium, for example, transfers, payment card, internet, and mobile phone.

In 2011, the volume of e-Payment transactions, which include high-value funds transfer, retail bulk payment, inter-bank transfer through Online Retail Funds Transfer (ORFT), payment card, internet banking, and e-Money totaled 93.4 percent while cheque payment amounted to 6.6 percent. E-Payment transactions, thus, increased by 10.3 percent from the previous year and it is expected that the trend will continue in the periods ahead as banks introduce new electronic services and consumers become more comfortable with e-payment.

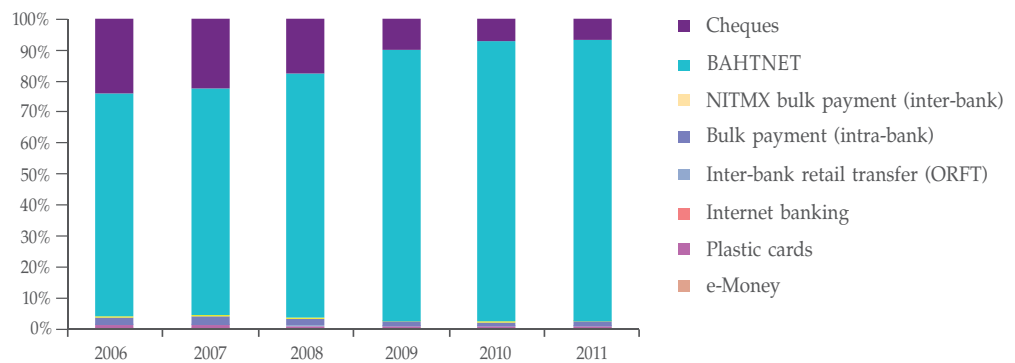


Figure 9: Comparison of various payment instruments in volume of transaction



Source: Bank of Thailand

Figure 10: Comparison of various payment instruments in value of transaction

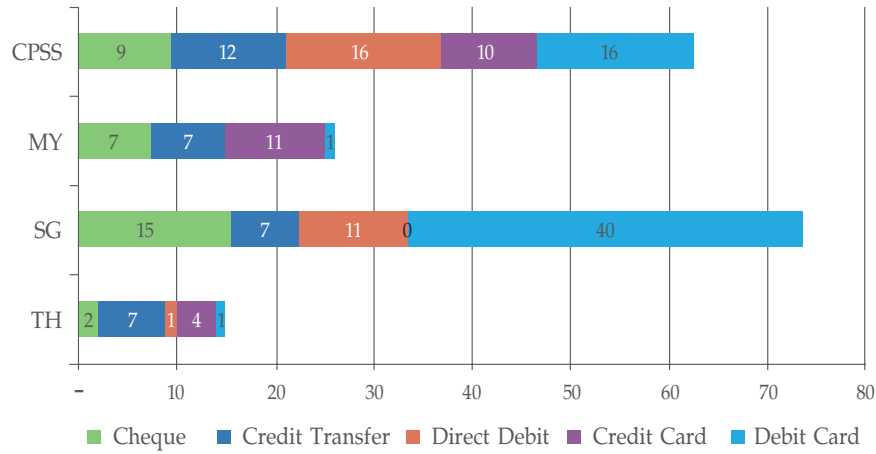


Source: Bank of Thailand

In terms of value, in 2011, BAHTNET transfer still accounted for the highest proportion of payment transaction value at 89.9 percent. Next was cheque payment, which accounted for 6.6 percent though the amount has been declining since 2007 while e-Payment has increasingly become more important. In many countries, the trends in cheque and e-Payment transactions are similar to Thailand's. However, it is interesting to note that the ratio of debit card transactions in Thailand remained quite low compared to advanced economies like Singapore or CPSS countries.¹⁶

¹⁶ Includes Australia, Belgium, Brazil, Canada, China, France, Germany, Hong Kong, India, Italy, Japan, Korea, Mexico, Netherlands, Russia, Saudi Arabia, Singapore, South Africa, Sweden, Switzerland, Turkey, Great Britain, and the United States.

Figure 11: Volume of transactions per capital as of 2011



Source: BIS Statistics on PSS in the CPSS Countries,
Bank Negara Malaysia and Bank of Thailand

3.2.1 Use of cash

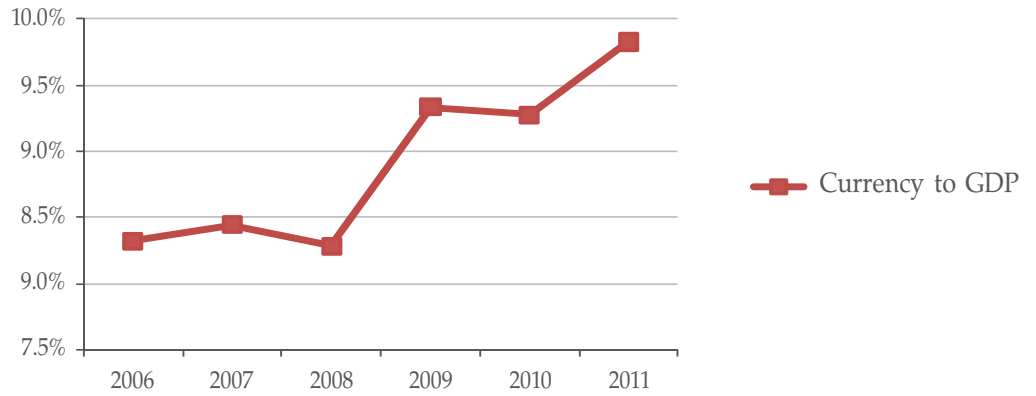
Currency in circulation per capita increased in line with the expansion of the Gross Domestic Product (GDP) and registered at 16,168 baht per capita in 2011, up from 14,671 baht per capita in 2010.

Table 8: Currency in circulation per capita

	2549	2550	2551	2552	2553	2554
Currency in circulation per capita (baht)	10,392	11,422	11,868	13,285	14,671	16,168

Source: Bank of Thailand

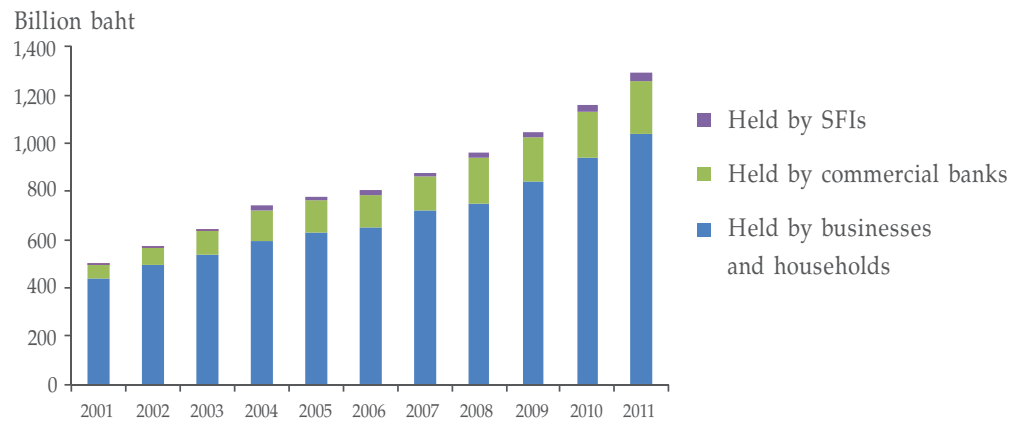
Figure 12: Ratios of currency to GDP



Source: Bank of Thailand

The ratio of currency to GDP registered at 9.8 percent. Nevertheless, at the disaggregated level, cash in hand has been on an increasing trend whereby in 2011, it increased by 11.9 percent from the previous year. This was partly a result of emergency cash needs during the floods.

Figure 13: Composition of currency



Source: Bank of Thailand

3.2.2 Cheque clearing system

In 2011, the volume of cheque usage (including inter-bank and intra-bank cheques) totaled at 115.4 million cheques, increasing by 0.8 percent from the previous year. Of these, the total value of cheque usage was 56.2 trillion baht, increasing by 8.6 percent from the previous year. The value per collected cheque averaged at 0.5 million baht, slightly increasing by 7.8 percent from 0.4 million baht in the previous year. The number of cheques per capita was 1.8.

The number of returned cheques totaled at 1.5 million cheques, equivalent to the total value of 268.6 billion baht. Of these, 0.9 million cheques worth 156 billion baht were returned on the ground of insufficient funds. Moreover, the ratios of the volume and value of dishonoured cheques to collected cheques were 0.9 and 0.3 percent, respectively, remaining close to last year's numbers.

Inter-bank cheque clearing system

The inter-bank cheque clearing system is an important payment systems service where the BOT acts as the centre for data and cheque exchange between member banks to support inter-bank cheque deposits. The inter-bank cheque clearing system comprises of (1) the Electronic Cheque Clearing System (ECS)¹⁷ for Bangkok and vicinity, (2) the Provincial Cheque Clearing System for other provinces, and (3) the Bill for Collection (B/C) system for inter-provincial clearing.

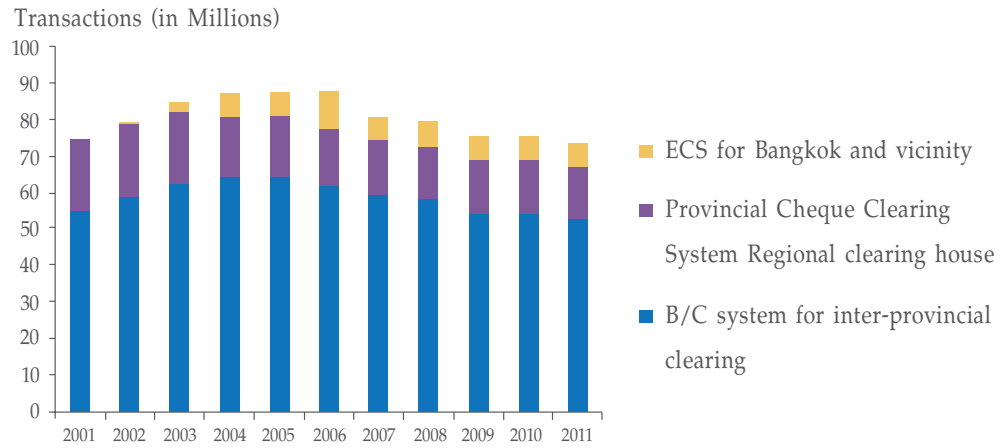
In 2011, the total number of inter-bank cheques stood at 73.6 million cheques, equivalent to the total value of 35,806 billion baht. Compared to 2010, the volume declined by 2.0 percent while the value increased by 6.0 percent.

The proportions of the volume and value of cheques processed in Bangkok and vicinity in 2011 remained similar to those in the previous year at 70.8 and 89.0 percent, respectively. Meanwhile, the proportions of the volume and value of cheques processed in other provinces stood at 20.1 and 9.8 percent, respectively. B/C or inter-provincial cheques continued to remain the least at 9.1 and 1.2 percent of the total volume and value, respectively. (Figures 14-15)

¹⁷ The BOT began using the ICAS in Bangkok and vicinity instead of the ECS on 3 February 2012

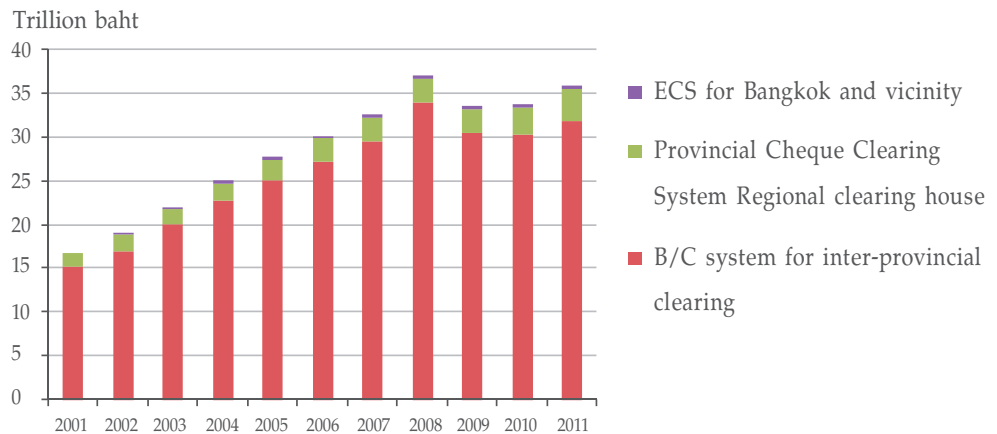


Figure 14: Volume of inter-bank cheques classified by clearing system



Source: Bank of Thailand

Figure 15: Value of inter-bank cheques classified by clearing system



Source: Bank of Thailand

Intra-bank cheque clearing system

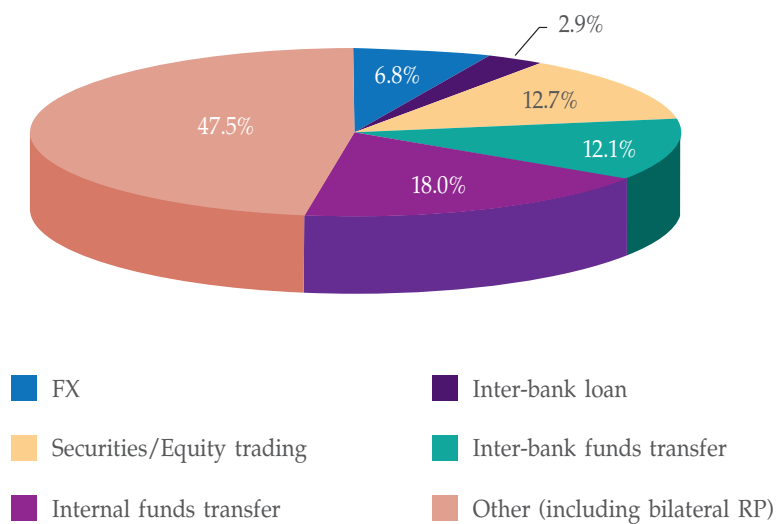
The BOT started to collect information on in-house cheque clearing from commercial banks and some SFIs since 2006. Such information includes the volume and value of intra-bank cheques cleared within Bangkok and vicinity, in other provinces, and inter-provincially.

In 2011, the volume of intra-bank cheques totaled at 41.8 million cheques, equivalent to the total value of 20,362.9 billion baht. Compared to 2010, such volume and value of intra-bank cheques increased by 6.1 and 13.6 percent, respectively. The ratios of the volume and value of intra-bank cheques to total collected cheques stood at 36.2 and 36.3 percent, respectively.

3.2.3 High-value funds transfer system

The BAHTNET system (Bank of Thailand Automated High-Value Transfer Network) is an inter-bank high-value funds transfer system developed and operated by the BOT. The system is available for financial institutions as well as other institutions to help reduce risk in high-value funds transfer, making the transaction fast and safe. Major transactions through BAHTNET include inter-bank funds transfers, foreign exchange trading, inter-bank lending, internal funds transfers, securities purchases, government bond purchases and others. (Figure 16)

Figure 16: Value of BAHTNET transfers classified by business type in 2011



Source: Bank of Thailand

At the end of 2011, there were 65 BAHTNET participating institutions, consisting of 16 Thai commercial banks, 15 foreign bank branches, 11 finance and securities companies, 14 Specialized Financial Institutions, government agencies and other institutions, and 9 departments of BOT. There were 2.7 million BAHTNET transactions recorded, up from 2.3 transactions in 2010 - an increase of 17.4 percent. The total value of these transactions stood at 765.7 trillion baht, increasing from 654.6 trillion baht recorded the previous year, or an increase of 17.0 percent. This increase was chiefly due to bilateral repurchase operations with the BOT.



BAHTNET transactions can be categorized as follows.

1) Inter-bank funds transfers

The total number of transactions in this category stood at 187,403 transactions with a total value of 574.6 trillion baht. Such volume and value of inter-bank funds transfers increased from the previous year by 14.2 and 14.4 percent, respectively. The increase in terms of value was mainly a result of the continued increase in bond trading with primary dealers under the bilateral repurchase agreements.

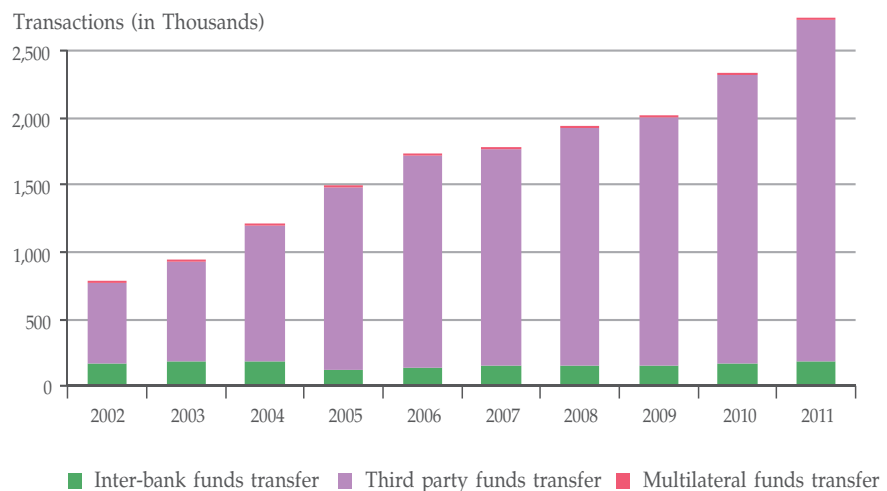
2) Third-party funds transfers

The total number of transactions in this category stood at 2,537,118 transactions with a total value of 182.3 trillion baht. Such volume and value of third-party funds transfers increased from the previous year by 17.7 and 26.3 percent, respectively.

3) Multilateral funds transfers (settlement and netting between institutions)

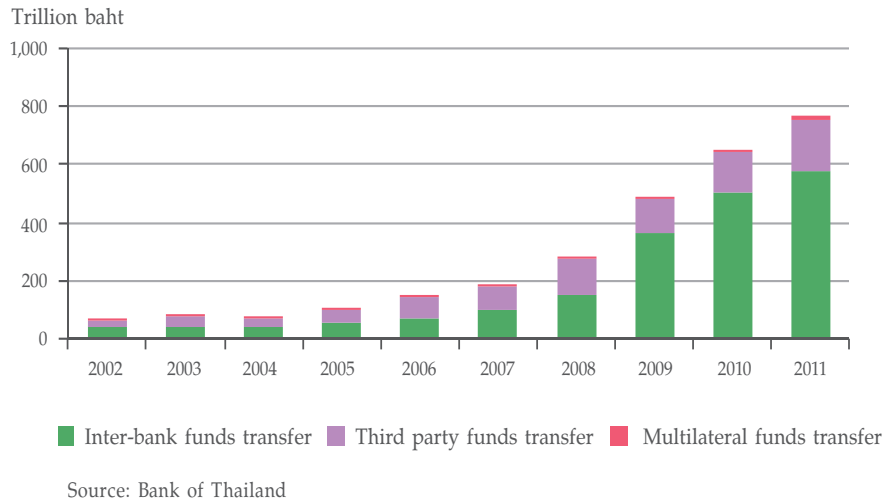
The total number of transactions in this category stood at 3,403 transactions, equivalent to 8.9 trillion baht in value. The volume and value of transactions in this category increased from the previous year by 1.3 and 7.6 percent, respectively. (Figures 17-18)

Figure 17: Volume of BAHTNET funds and securities transfers



Source: Bank of Thailand

Figure 18: Value of BAHTNET funds and securities transfers

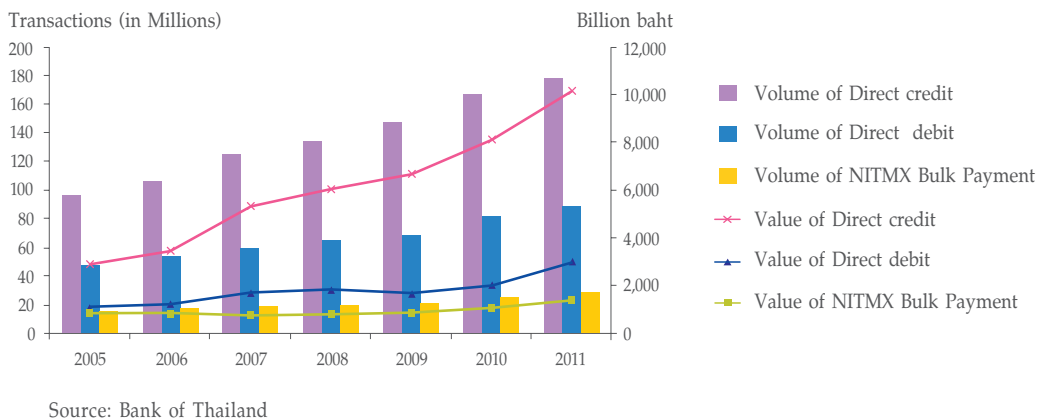


3.2.4 Bulk payment

The retail funds transfers (bulk payment) is a pre-authorized funds transfer for retail funds transfers of regular payments and/or multiple transfer transactions. It can be classified into

- (1) In-house pre-authorized transactions which include direct credit transactions such as transfers of salaries, wages, dividends, tax refunds, as well as direct debit transactions such as payment of utility bills, insurance premiums, and credit card payments; and
- (2) Inter-bank pre-authorized transfers or NITMX Bulk Payment System which is operated by NITMX and provides only account crediting services.

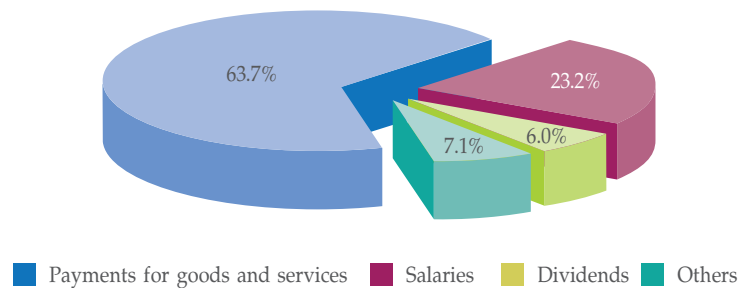
Figure 19: Volume and value of bulk payment



In 2011, the value of bulk payment totaled at 14.6 trillion baht, increasing by 29.8 percent from the previous year. The total number of transactions stood at 294.1 million transactions, increasing by 8.3 percent. Of these, direct credit transactions accounted for the highest proportion in terms of both volume and value at 60.6 and 69.8 percent, respectively. Next in line were direct debit transactions, which accounted for 29.9 percent of the total volume and 20.7 percent of the total value, respectively. Meanwhile, the NITMX Bulk Payment system accounted for 9.5 percent of the total volume and 9.6 percent of the total value, respectively. (Figure 19)

Retail funds transfers through the NITMX Bulk Payment System stood at 27.9 million transactions this year, equivalent to the total value of 1,392.9 billion baht - increasing from the previous year by 12.9 and 28.9 percent, respectively. In terms of volume, payments for goods and services accounted for the highest portion at 63.7 percent. Second was payment of salaries and wages at 23.2 percent.

Figure 20: Proportion of value of funds transfers via NITMX Bulk Payment system



Source: Bank of Thailand

Total direct credit transfers stood at 178.1 million transactions, equivalent to the total value of 10,163.4 billion baht, increasing by 7.1 and 25.1 percent, respectively. Most of the transfers were for salaries and wages, which accounted for 49.1 percent of the total value and 78.6 percent of the total volume of transfers, respectively.

At the same time, total direct debit transfers stood at 88.1 million transactions, increasing by 9.3 percent. The total value of these transactions was 3,013.8 billion baht, increasing by 49.1 percent. Almost all of such transfers were for payments of goods and services, which accounted for 90.5 percent of the total value and 97.0 percent of the total volume of transfers, respectively. (Figure 20)

3.2.5 Bank and non-bank counter services

Bill payment

In 2011, the number of bill payments for utilities and purchases of goods and services at bank and non-bank counters registered at 281.4 million transactions, representing a total value of 5,950.2 billion baht. Of these, non-bank counter services accounted for as high as 200.4 million transactions or 71.2 percent of the total number of transactions, worth 511.3 billion baht. Such development was likely a result of non-banks' marketing strategy to reduce fees and charges and their convenient locations. At the same time, bank counter services accounted for 80.9 million transactions, declining by 2.2 percent from the previous year. However, the total value of transactions through bank counter services were significantly higher than those through non-banks, part of which was high-value cheque payment which stood at 5,438.9 billion baht, representing an increase of 2.7 percent from the previous year.

Cash continued to be the most popular means for bill payment at bank and non-bank counters and accounted for 97.4 percent of the total volume and 41.5 percent of the total value of transactions, respectively. The second most popular means for payment was cheque, which accounted for 0.7 percent of the total volume and 43.7 percent of the total value of transactions, respectively.

Box 9: Bill payment service providers

The number of authorized electronic bill payment service providers according to the Royal Decree Regulating Electronic Payment Service Business B.E. 2551 was 33 providers - of which 19 providers are banks and 14 providers are non-banks.

Banks

1. Bangkok Bank Public Company Limited
2. Bank of Ayudhya Public Company Limited
3. Bank of Tokyo-Mitsubishi UFJ Limited
4. CIMB Thai Bank Public Company Limited

Non-banks

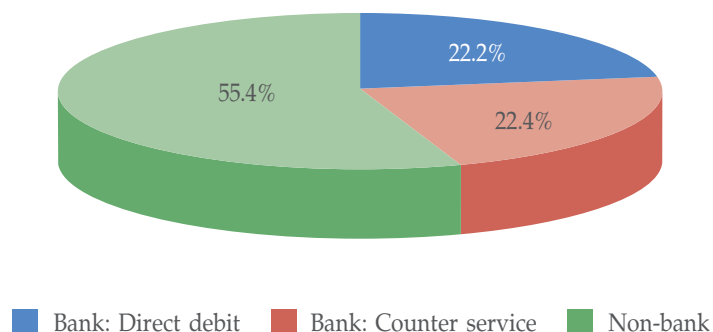
1. Advanced Info Service Public Company Limited
2. Advanced mPay Company Limited*
3. AEON Thana Sinsap (Thailand) Public Company Limited
4. CAT Telecom Public Company Limited*



5. Citibank N.A.	5. Counter Service Company Limited
6. Deutsche Bank A.G.	6. Ek-Chai Distribution System Company Limited
7. Hongkong and Shanghai Banking Corporation Limited	7. Global Service Center Company Limited
8. JPMorgan Chase Bank, National Association	8. J Mart Public Company Limited
9. Kasikornbank Public Company Limited	9. Saha Pathanapibul Public Company Limited
10. Krung Thai Bank Public Company Limited	10. Samart I-Mobile Public Company Limited
11. Land and House Retail Bank Public Company Limited	11. Siam Family Mart Limited
12. Siam Commercial Bank Public Company Limited	12. Thailand Post Company Limited
13. Standard Chartered Bank (Thai) Public Company Limited	13. TOT Public Company Limited
14. Sumitomo Mitsui Banking Corporation	14. True Money Company Limited
15. Thai Credit Retail Bank Public Company Limited	
16. Thanachart Bank Public Company Limited	
17. Tisco Bank Public Company Limited	
18. TMB Bank Public Company Limited	
19. United Overseas Bank (Thai) Public Company Limited	

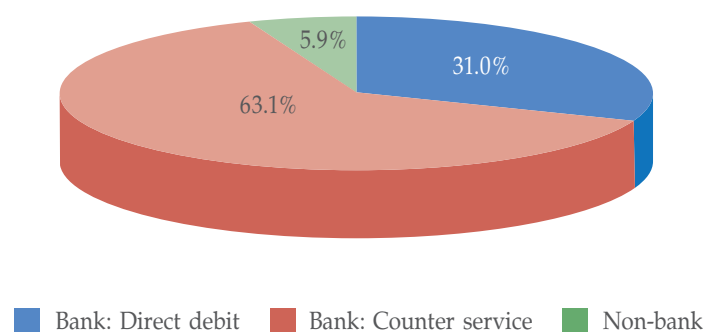
* Not yet operational

Figure 21: Proportion of volume of bill payment via banks and non-banks in 2011



Source: Bank of Thailand

Figure 22: Proportion of value of bill payment via banks and non-banks in 2011



Source: Bank of Thailand

By comparing different payment channels offered by banks and non-banks, it can be observed that in terms of volume, non-bank counter services were the most popular channel, accounting for 55.4 percent of all bill payment transactions. However, in terms of value, bank counter services were the most popular channel, accounting for 63.1 percent of the total value of transactions. (Figures 21-22)

Inter-bank transfers at the counter through the Online Retail Funds Transfer (ORFT) system

Transfer through ORFT is an inter-bank transfer offered at the counter. The transferor does not need to have an account at the transferring bank, where by transfers can be made to the transferee's account at one of the eleven banks¹⁸.

¹⁸ Bangkok Bank, Bank of Ayudhya, CIMB Thai, KBank, Krung Thai Bank, Siam Commercial Bank, Standard Chartered Bank (Thai), Thai Credit Retail Bank, Thanachart Bank, TMB Bank and UOB.

ORFT transfers totaled at 10.0 million transactions, equivalent to the total value of 213.1 billion baht, increasing from the previous year by 9.3 and 23.9 percent, respectively.

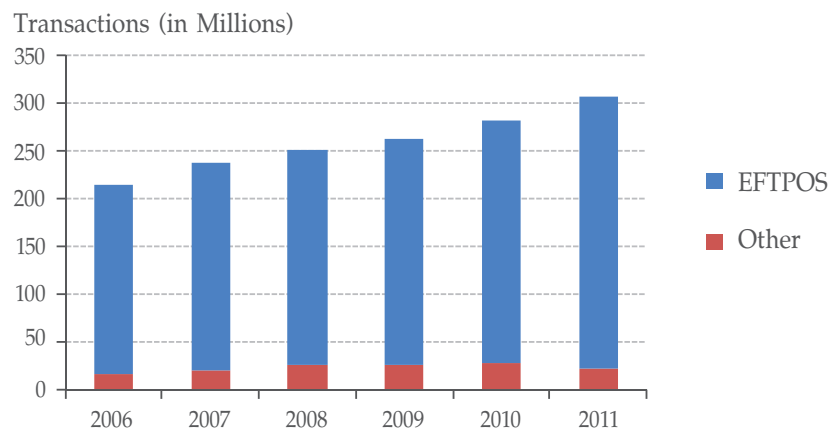
3.2.6 Plastic cards

Plastic cards, which include credit, debit and ATM cards, continued to be important alternatives to cash payments given their safety, convenience and cost savings both in terms of note printing and cash management and handling of retailers and banks. In 2011, debit card usage for payment for goods and services continued to expand robustly. However, the value of payment transactions remained low compared to cash withdrawals. Even-though debit cards can be used to pay for goods and services in the same way as credit cards, debit card holders were still more inclined to treat them like ATM cards - using them mainly for cash withdrawals.

Credit cards

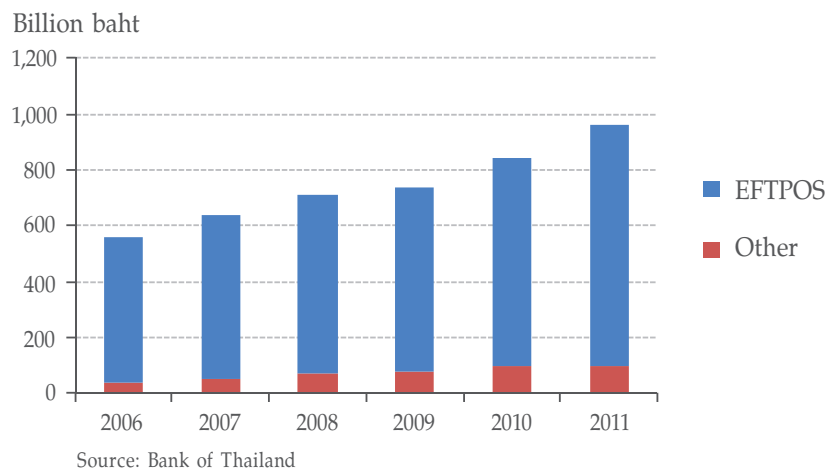
The value of credit card transactions in 2011 totaled at 1,174.4 billion baht, increasing by 11.7 percent from the previous year's total value of 1,051.6 billion baht. In terms of the usage of credit cards for payments of goods and services, it can be observed that credit card holders continued to prefer payment through EFTPOS the most with the volume and value of transactions registering at 92.3 and 89.8 percent of the total volume and value of credit card transactions, respectively. Meanwhile, usage through the internet continued to be at the same level as the previous year both in terms of volume and value.

Figure 23: Volume of credit card transactions classified by channel in 2011



Source: Bank of Thailand

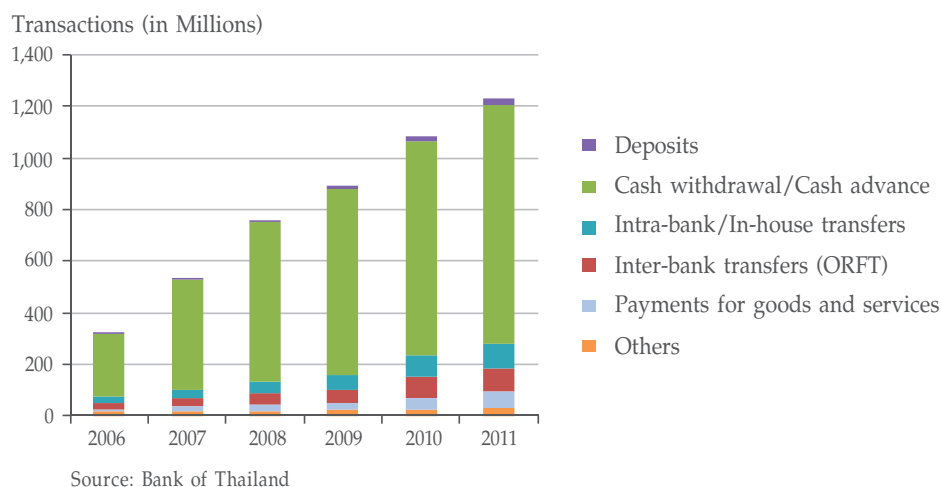
Figure 24: Value of credit card transactions classified by channel in 2011



Debit cards¹⁹

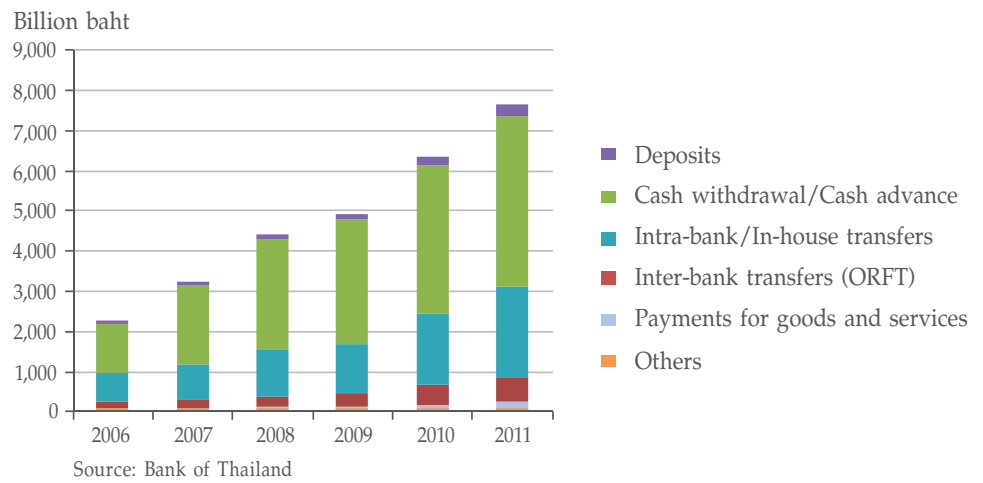
Debit cards were still mostly used to withdraw cash in the same manner as ATM cards while usage of debit cards for payments of goods and services remained very low. In 2011, the number of cash withdrawals from bank accounts (excluding SFIs) through debit cards was 920.0 million transactions, accounting for 74.7 percent of all debit card transactions. Meanwhile, the proportions of inter- and intra-bank transfers through debit cards were only 7.8 and 7.4 percent, respectively. At the same time, the proportion of debit card usage for payments of goods and services was 5.1 percent.

Figure 25: Volume of debit card transactions



¹⁹ Data collect from banks, excluding SFIs, and classified by type of usage.

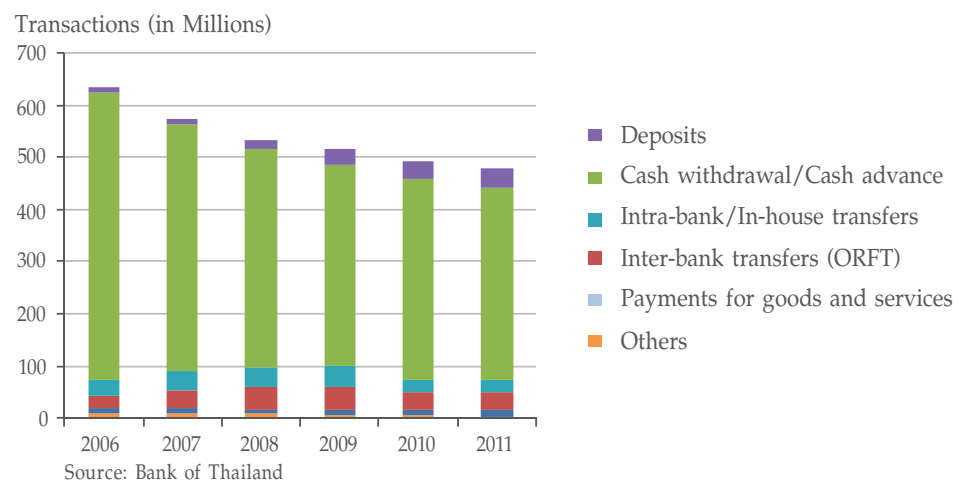
Figure 26: Value of debit card transactions



ATM cards²⁰

ATM transactions were mostly relating to cash withdrawals, which accounted for 76.8 percent of the total volume of usage. Second were transfers, which accounted for 12.4 percent. In this regard, usage of commercial banks’ ATM cards (excluding SFIs) continued to decline from the previous year, from 491.3 to 479.6 million transactions, or equivalent to a decrease of 2.4 percent. It is interesting to observe that the number of transactions has been decreasing for five years in a row since 2007 due to the reduction in the number of ATM cards. Nevertheless, cash deposits through ADM terminals continued to grow and in 2011, the volume expanded by as high as 11.4 percent. From these statistics, it can be seen that cash deposits through ADM terminals were welcomed by users.

Figure 27: Volume of ATM card transactions



²⁰ Data collect from banks excluding SFIs, and classified by type of usage.

Figure 28: Value of ATM card transactions 2011

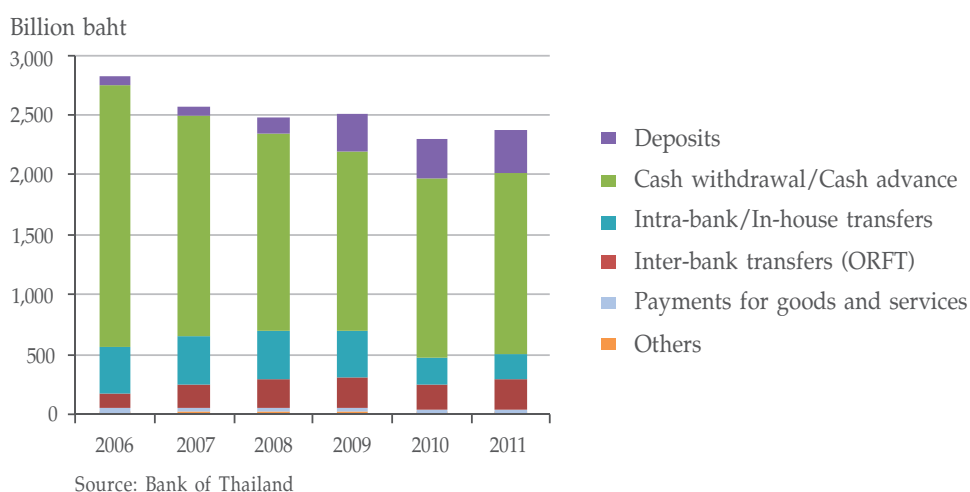


Table 9: Commercial banks' plastic card transactions in 2011

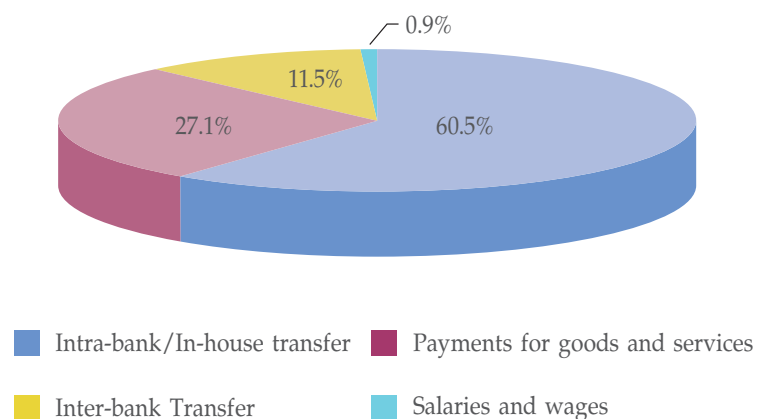
	Volume		Value	
	Transactions (in Millions)	Percentage	Billion baht	Percentage
ATM cards				
- Withdrawals	368.1	76.8%	1,501.6	63.7%
- Transfers	59.5	12.4%	465.6	19.8%
- Payments for goods and services	11.5	2.4%	26.0	1.1%
- Deposits	37.1	7.7%	363.2	15.4%
- Others	3.4	0.7%	0.7	0.0%
Total	479.6	100.0%	2,357.1	100.0%
Debit cards				
- Withdrawals	920.0	74.7%	4,275.1	56.1%
- Transfers	187.5	15.2%	2,865.7	37.6%
- Payments for goods and services	62.9	5.1%	184.9	2.4%
- At point of sale	25.1	2.0%	80.9	1.1%
- Others such as ATM	37.8	3.1%	104.0	1.3%
- Deposits	28.3	2.3%	294.2	3.9%
- Others	32.5	2.7%	0.0	0.0%
Total	1,231.2	100.0%	7,619.9	100.0%

3.2.7 Internet banking²¹

Internet banking was popular among bank customers and usage expanded swiftly in line with greater confidence in the security system. In 2011, the number of internet banking transactions increased by 37.9 percent from 60.8 million transactions to 83.8 million transactions. The total value of transactions in turn rose by 11.3 percent, from 7.9 to 8.8 trillion baht.

According to usage type, intra-bank transfers accounted for 60.5 and 64.8 percent of all transactions in terms of volume and value, respectively. Payments for goods and services registered at 27.1 and 29.5 percent in terms of volume and value, respectively. Inter-bank transfers were 11.5 and 1.8 percent in terms of volume and value, respectively. Finally, payments of salaries and wages were 0.9 and 3.9 percent in terms of volume and value, respectively.

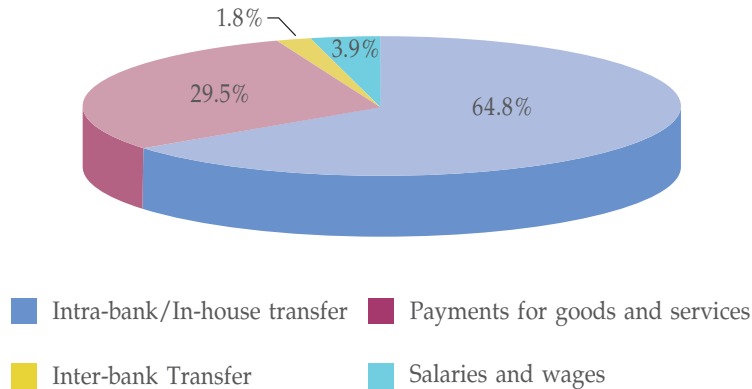
Figure 29: Volume of internet banking transactions in 2011



Source: Bank of Thailand

²¹ Includes internet banking performed on mobile phones

Figure 30: Value of internet banking transactions in 2011



Source: Bank of Thailand

3.2.8 Electronic money (e-Money)

At the end of 2011, there were 20 e-Money operators²² under legal supervision²³, increasing from 3 operators registered last year. They can be categorized into two types as follows:

1. The provision of e-Money services for the purchase of goods and services from many service providers at the outlets which are part of the same sales and distributions system. At the end of 2011, there were 5 non-bank e-Money service providers in this category.
2. The provision of e-Money services for the purchase of goods and services from many service providers with no restrictions on outlets and sales and distributions systems. There were 7 bank and 8 non-bank e-Money service providers in this category.

Usage of e-Money continued to gain popularity. At the end of 2011, the volume and value of e-Money transactions was 348.2 million transactions, equivalent to the total value of 24.7 billion baht²⁴, increasing from the previous year by 57.2 and 39.4 percent, respectively. There were 13.8 million cards or accounts in the system, increasing by 20.2 percent from the previous year.

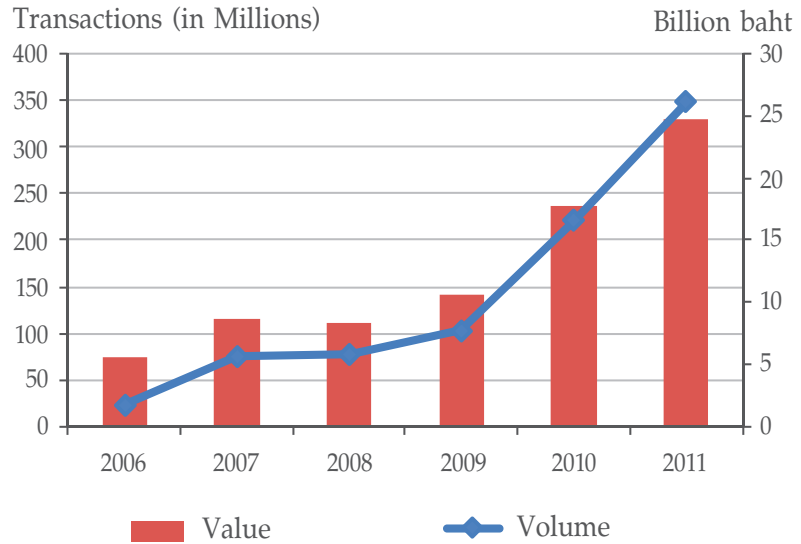
²² Names of service providers can be found on the BOT's website: www.bot.or.th under "Payment Systems"

²³ The provision of e-Money services is governed by two pieces of legislations namely the Ministry of Finance's Notification on Business that Requires a Permit According to Section 5 of the Notification of the Revolution Council NO. 58 (e-Money operations) and the Royal Decree Regulating on Electronic Payment Service Business, B.E. 2551 (2008).

²⁴ excluding e-Money cards for prepaid mobile phones



Figure 31: Volume and value of e-Money transactions



Source: Bank of Thailand

3.3 Postal transfer and payment

Figure 32: Volume and value of funds transfers via Pay at Post

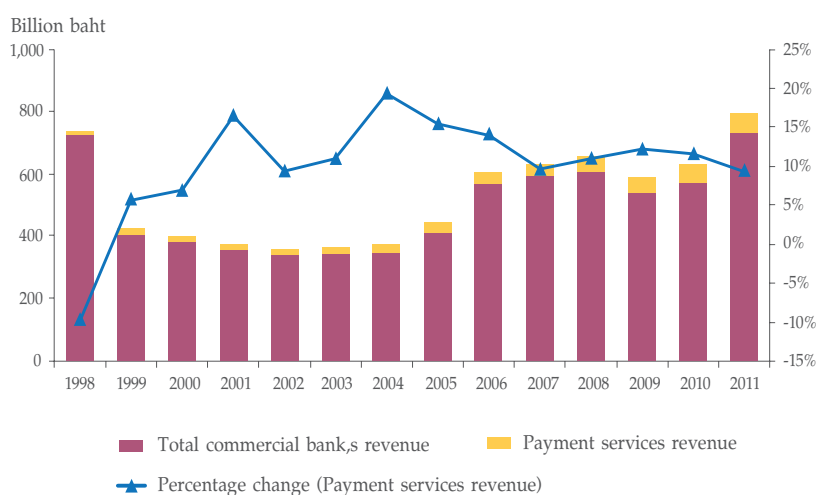


Source: Bank of Thailand

In 2011, postal transfer and payment fell marginally in both volume and value terms from 29.0 million transactions worth 92.2 billion baht to 28.4 million transactions worth 91.3 billion baht, declining by 2.1 percent in volume and 1.0 percent in value, respectively. Bill payment remained the main category of transactions conducted through Thailand Post Company Limited.

3.4 Revenue from payment services

Figure 33: Revenue from payment services



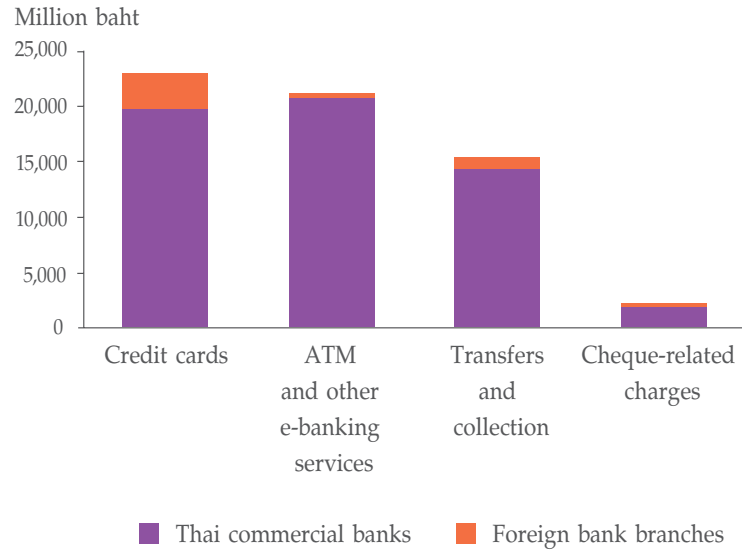
Source: Bank of Thailand

Commercial banks' revenue from payment systems services in 2011 totaled at 65.4 billion baht or 9.0 percent of total revenue, and representing a growth rate 9.3 percent (5.5 billion baht), decelerating somewhat from 11.8 percent registered in the previous year.

Of all payment systems services revenue, the top three categories were credit card usage (37.1 percent), followed by ATM usage and electronic banking (34.1 percent), and transfers and collection (25.2 percent). It should be noted that the main source of payment systems services revenue of Thai banks were ATM usage and electronic banking, which accounted for 36.5 percent of their total payment services revenue while those of foreign banks were credit card services, which accounted for 71.0 percent of their total payment services revenue.



Figure 34: Revenue from payment services classified by type in 2011



Source: Bank of Thailand



4. Glossary and abbreviation

ACGM	ASEAN Central Bank Governors' Meeting
ADSL	Asymmetric digital subscriber line (high-speed internet)
AEC	ASEAN Economic Community
AML/CFT	Anti-Money Laundering and Countering Financing of Terrorism
AMLO	Anti-Money Laundering Office
ATM	Automated Teller Machine
BAHTNET	Bank of Thailand Automated High-value Transfer Network
BCP	Business Continuity Plan
BIS	Bank for International Settlements
BOS	Banknote Ordering System
BOT	Bank of Thailand
CLS	Continuous Linked Settlement
EFTPOS	Electronic Funds Transfer at Point of Sale
e-Money	Electronic Money
e-Payment	Electronic Payment
EWC	e-payment Working Committee
FRBNY	Federal Reserve Bank of New York
FSAP	Financial Sector Assessment Program
FX	Foreign Exchange
HKMA	Hong Kong Monetary Authority
HKICL	The Hong Kong and Shanghai Banking Corporation Limited
ICAS	Imaged Cheque Clearing and Archive System
ICS	Imaged Cheque Clearing System





ILF	Intraday Liquidity Facilities
IMF	International Monetary Fund
ISO	International Organization for Standardization
NECTEC	National Electronics and Computer Technology Center
NGO	Non-Governmental Organization
NITMX	Bulk payment - credit next day Inter-bank retail fund transfers for large volume transactions
NITMX	National ITMX Company Limited
Non-bank	Non financial institutions
PKI	Public Key Infrastructure
PSRSC	Payment Systems Roadmap Steering Committee
PSC	Payment Systems Committee
PSRWG	Payment Systems Roadmap Working Group
PvP	Payment versus Payment
ROSCs	Reports on the Observance of Standards and Codes
RTGS	Real Time Gross Settlement
SITI	Thai Industrial Standards Institute
SRS	Securities Requirement for Settlement
TC68	Technical Committee 68 - a Committee responsible for the supervision and standards setting of banking businesses
USD-CHATS	US Dollar Clearing House Automated Transfer System
WC-PSS	Working Committee on Payment and Settlement System



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Table 1: Basic statistical data

	2006	2007	2008	2009	2010	2011 ^P
Population (millions)	62.83	63.04	63.39	63.53	63.88	64.08
GDP current price (billion baht)	7,844.9	8,525.2	9,080.4	9,041.5	10,104.8	10,539.4
GDP per capita (baht)	124,861.72	135,238.53	143,247.18	142,329.65	158,184.10	164,482.80
Exchange rate vis-a-vis US\$ (at year-end)	36.04	33.75	34.93	33.36	30.15	31.70

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

^P Preliminary Data

Table 2: Technological infrastructure

	2006	2007	2008	2009	2010	2011
Total fixed network telephone subscribers (millions)	7.04	7.02	6.97	6.85	6.65	6.43
Total mobile telephone subscribers (millions)	41.30	51.60	63.69	69.50	73.05	78.36
Postpaid	6.32	5.60	6.54	7.39	7.84	7.93
Prepaid	34.98	46.00	57.15	62.11	65.21	70.44
Penetration rates						
Fixed network telephone (%)	11.21	11.14	10.99	10.78	10.41	10.03
Mobile telephone (%)	65.73	81.86	100.48	109.40	114.36	122.29

Sources: CAT Telecom Public Company Limited, TOT Public Company Limited

Table 3: Narrow Money¹ (at year-end, billion baht)

	2006	2007	2008	2009	2010	2011 ^P
Currency	806.37	878.33	962.63	1,045.11	1,156.43	1,294.19
Held by business and household sector	652.90	720.05	752.33	843.96	937.20	1,035.99
Held by commercial banks	135.11	140.24	184.76	178.97	193.50	221.29
Held by finance companies	0.00	0.00	0.00	0.00	0.00	0.00
Held by specialized banks	17.13	16.71	24.23	22.18	25.74	36.91
Demand deposits	258.57	279.85	288.90	330.59	365.24	378.28
Demand deposits at Bank of Thailand	3.67	3.85	15.11	3.13	2.94	3.05
Demand deposits at commercial banks	252.06	271.41	269.77	321.33	357.38	368.19
Demand deposit at specialized banks	2.84	4.59	4.02	6.14	4.92	7.04
Narrow Money	911.47	999.90	1,041.22	1,174.55	1,302.44	1,414.27
Currency held by business and household sector as % of Narrow money	71.6%	72.0%	72.3%	71.9%	72.0%	73.3%
Demand deposits held by business and household sector as % of Narrow money	28.4%	28.0%	27.7%	28.1%	28.0%	26.7%

Source: Bank of Thailand

¹ circulation and demand deposits at commercial banks and specialized banks

^P Preliminary Data

Table 4: Settlement media used by non-banks (at year-end, billion baht)

	2006	2007	2008	2009	2010	2011 ^p
Banknotes and coins ¹	652.90	720.05	752.33	843.96	937.20	1,035.99
Demand deposits	258.57	279.85	288.90	330.59	365.24	378.28
Narrow money ²	911.47	999.90	1,041.22	1,174.55	1,302.44	1,414.27
Broad money ³	8,573	9,109	9,944	10,617	11,779	13,566

Source: Bank of Thailand

¹ Banknotes outside depository corporations and coins issued by central government

² Currency in circulation and demand deposits at commercial banks and specialized banks

³ Currency in circulation and all kinds of deposits at commercial banks, specialized banks, and PN issued by financial companies

^p Preliminary Data

Table 5: Settlement media used by banks (at year-end, billion baht)

	2006	2007	2008	2009	2010	2011 ^p
Balances held at central bank	56.8	51.5	58.5	48.2	78.2	59.3
Required reserves	404.8	408.2	426.7	425.9	457.8	488.5
Free reserves	743.2	921.2	1,382.2	1,908.3	2,110.7	2,004.5
Transferable deposits at other banks	5.1	6.7	5.0	3.7	6.7	7.9
Memorandum item:						
Institutions borrowing from central bank	80.1	75.8	19.2	14.9	10.0	0.0

Source: Bank of Thailand

^p Preliminary Data



Table 6: Indicators of the use of various cashless payment instruments						
Volume of transactions (in thousands)						
	2006	2007	2008	2009	2010	2011 ^P
Paper-based ¹ :	127,774	130,235	129,126	123,202	114,558	115,431
In-house cheque	43,681	49,503	49,900	48,310	39,435	41,833
Interbank cheque	84,093	80,732	79,227	74,892	75,123	73,598
Payment cards:	1,214,314	1,401,241	1,601,273	1,747,320	1,942,936	2,132,241
ATM card ²	646,304	592,653	555,826	556,613	542,707	561,136
for cash withdrawal	553,837	473,532	419,610	387,175	422,546	429,288
for other purposes ³	92,467	119,121	136,216	169,438	120,161	131,848
Debit card	326,105	538,288	761,142	895,708	1,085,356	1,231,241
for cash withdrawal	245,342	428,643	617,729	724,622	828,607	920,029
for purchasing purpose via EFTPOS	6,762	9,536	11,496	11,913	13,802	25,057
for other purposes ⁴	74,002	100,108	131,918	159,172	242,948	286,155
Credit card ⁵	241,904	270,300	284,305	294,999	314,873	339,865
for purchasing purpose	215,010	237,798	251,128	263,424	282,597	308,212
for other purposes ⁶	26,894	32,502	33,177	31,575	32,276	31,653
Automated:	177,801	203,536	220,128	237,630	274,019	296,861
Direct credit ⁷	105,731	124,236	134,010	146,151	166,372	178,147
Direct debit ⁸	53,277	59,967	64,985	68,583	80,621	88,086
NITMX Bulk Payment (SMART)	17,072	17,568	19,205	20,891	24,702	27,901
BAHTNET ⁹	1,721	1,766	1,929	2,005	2,323	2,728

Source: Bank of Thailand

Source: Bank of Thailand

¹ Since 2006, Data include in-house cheque from banks, however, some banks do not report in-house provincial and B/C cheque.

² Include data from three Special Financial Institutions.

³ Data include purchasing goods and services, deposit and funds transfer

⁴ Data include purchasing goods and services via other channels, cash withdrawal, deposit and funds transfer

^P Preliminary Data

⁵ Data include bank cards/affinity cards, non-bank cards/affinity cards and foreign credit cards used in Thailand

⁶ Data include cash withdrawal, cash advance, deposit and funds transfer

⁷ Intra-bank pre-authorized direct credit

⁸ Intra-bank pre-authorized direct debit

⁹ Data include interbank funds transfer, third party funds transfer, DVP/RVP for securities, Multilateral Funds Transfer and Bilateral R/P.

Table 7: Indicators of the use of various cashless payment instruments
Value of transactions (billion baht)

	2006	2007	2008	2009	2010	2011 ^P
Paper-based ¹ :	48,200	55,637	62,147	56,066	51,698	56,169
In-house cheque	18,080	23,099	25,061	22,473	17,918	20,363
Interbank cheque	30,121	32,537	37,086	33,593	33,780	35,806
Payment cards :	5,831	6,650	7,919	8,457	9,854	11,471
ATM card ²	2,859	2,607	2,645	2,643	2,508	2,677
for cash withdrawal	2,190	1,840	1,634	1,498	1,721	1,804
for other purposes ³	668	767	1,011	1,145	787	873
Debit card	2,240	3,205	4,354	4,876	6,294	7,620
for cash withdrawal	1,227	1,971	2,738	3,095	3,670	4,275
for purchasing purpose via EFTPOS	12	19	24	24	30	81
for other purposes ⁴	1,001	1,216	1,592	1,757	2,593	3,264
Credit card ⁵	732	839	921	937	1,052	1,174
for purchasing purpose	561	636	711	737	845	964
for other purposes ⁶	171	203	210	200	207	211
Automated :	148,778	190,210	286,191	498,861	665,846	780,284
Direct credit ⁷	3,436	5,351	6,044	6,698	8,121	10,163
Direct debit ⁸	1,238	1,699	1,847	1,676	2,021	3,014
NITMX Bulk Payment (SMART)	802	793	828	868	1,081	1,393
BAHTNET ⁹	143,302	182,368	277,472	489,619	654,623	765,714

Source: Bank of Thailand

¹ Since 2006, Data include in-house cheque from banks, however, some banks do not report in-house provincial and B/C cheque.

² Include data from three Special Financial Institutions.

³ Data include purchasing goods and services, deposit and funds transfer.

⁴ Data include purchasing goods and services via other channels, cash withdrawal, deposit and funds transfer.

⁵ Data include bank cards/affinity cards, non-bank cards/affinity cards and foreign credit cards used in Thailand.

⁶ Data include cash withdrawal, cash advance, deposit and funds transfer.

⁷ Intra-bank pre-authorized direct credit.

⁸ Intra-bank pre-authorized direct debit.

⁹ Data include interbank funds transfer, third party funds transfer, DVP/RVP for securities, Multilateral Funds Transfer and Bilateral R/P.

^P Preliminary Data



Table 8: Notes and coins (at year-end, million baht)						
	2006	2007	2008	2009	2010	2011
Notes and coins	806,380	878,331	993,148	1,095,159	1,187,828	1,346,437
Notes:	773,848	842,624	954,484	1,054,484	1,144,480	1,299,484
500000 baht	118	117	117	117	116	117
1000 baht	571,739	628,175	701,711	774,058	889,617	1,028,838
500 baht	94,712	98,497	119,283	140,972	113,746	119,826
100 baht	74,843	82,435	97,484	98,605	98,235	108,220
60 baht	1,154	1,157	1,161	1,163	1,166	1,173
50 baht	8,787	7,819	9,377	13,062	12,799	9,599
20 baht	19,038	20,741	21,674	22,835	25,134	28,045
10 baht	3,218	3,357	3,351	3,346	3,342	3,340
5 baht	123	196	196	196	195	196
1 baht	107	121	121	121	121	121
50 satang	9	9	9	9	9	9
Coins:	32,532	35,707	38,664	40,675	43,348	46,953

Source: Bank of Thailand

Table 9: Institutional infrastructure

	2006	2007	2008	2009	2010	2011 ^P
Central Bank						
Number of Institutions	1	1	1	1	1	1
Number of Branches	3	3	3	3	3	3
Number of Accounts ¹	366	287	260	226	231	231
Value of Accounts (million baht) ¹	174,639	151,137	159,678	250,262	422,059	353,916
Thai Commercial Banks						
Number of Institutions	15	18	18	17	17	16
Number of Branches	4,701	5,070	5,477	5,791	5,961	6,183
Number of Accounts	68,154,739	73,108,528	75,259,745	76,078,336	79,073,950	77,588,699
Value of Accounts (million baht)	5,925,445	5,843,995	6,535,094	6,557,653	6,886,058	7,270,603
Specialized Financial Institutions						
Number of Institutions	6	6	6	6	6	6
Number of Branches	1,699	1,768	1,796	1,853	2,002	2,240
Number of Accounts	45,475,345	36,651,097	42,713,869	41,618,537	37,838,856	37,366,503
Value of Accounts (million baht)	1,549,498	1,341,482	1,809,653	2,175,906	2,435,471	2,249,904
Foreign Bank Branches						
Number of Institutions	17	16	16	15	15	15
Number of Branches	17	16	16	15	15	18
Number of Accounts	83,180	219,789	90,115	89,866	92,402	96,165
Value of Accounts (million baht)	595,896	673,490	507,009	466,418	511,604	623,338
Post Office						
Number of Institutions	1	1	1	1	1	1
Number of Branches	1,158	1,176	1,188	1,254	1,281	1,295
Number of Accounts	-	-	-	-	-	-
Value of Accounts (million baht)	-	-	-	-	-	-

Sources: Bank of Thailand and Thailand Post Co., Ltd.

¹ Exclude regional offices

^P Preliminary Data



Table 10: Payment instructions handled by selected interbank settlement systems						
Volume of transactions (in thousands)						
	2006	2007	2008	2009	2010	2011
Paper-based:	84,093	80,732	79,227	74,892	75,123	73,598
ECS	61,445	59,026	57,833	53,926	53,864	52,116
Provincial Cheques	5,935	15,056	14,666	14,353	14,533	14,775
B/C ¹	6,714	6,649	6,728	6,613	6,726	6,707
Automated:	59,872	75,300	100,181	99,110	116,482	130,554
BAHTNET ²	1,721	1,766	1,929	2,005	2,323	2,728
NITMX Bulk Payment (SMART)	17,072	17,568	19,205	20,891	24,702	27,901
ORFT-ATM (on-line retail funds transfer)	41,079	55,966	79,047	76,214	89,456	99,926

Sources: Bank of Thailand and National ITMX Co., Ltd.

¹ Inter-provincial cheques exchanged at the Electronic Clearing House.

² Data include interbank funds transfer, third party funds transfer, DVP/RVP for securities, Multilateral Funds Transfer and Bilateral R/P.

Table 11: Payment instructions handled by selected inter-bank settlement systems						
Value of transactions (billion baht)						
	2006	2007	2008	2009	2010	2011
Paper-based:	30,121	32,537	37,086	33,593	33,780	35,806
ECS	27,175	29,524	33,912	30,473	30,247	31,861
Provincial Cheques	2,617	2,667	2,798	2,761	3,137	3,508
B/C ¹	329	346	376	359	396	437
Automated:	144,374	183,509	278,778	490,940	656,253	767,749
BAHTNET ²	143,302	182,368	277,472	489,619	654,623	765,714
NITMX Bulk Payment (SMART)	802	793	828	868	1,081	1,393
ORFT-ATM	270	349	478	453	549	642

Sources: Bank of Thailand and National ITMX Co., Ltd.

¹ Inter-provincial cheques exchanged at the Electronic Clearing House.

² Data include interbank funds transfer, third party funds transfer, DVP/RVP for securities, Multilateral Funds Transfer and Bilateral R/P.

Table 12: Securities transfer instructions handled by securities settlement systems						
Volume of transactions (in millions)						
	2006	2007	2008	2009	2010	2011
Bond registry system:						
Equity securities	-	-	-	-	-	-
Government securities	0.01	0.01	0.01	0.01	0.01	0.01
Book-entry system:						
Equity securities	2.45	2.36	2.41	2.46	2.83	2.66
Government securities	0.06	0.05	0.09	0.09	0.13	0.14

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)

	2006	2007	2008	2009	2010	2011
Bond registry system:						
Equity securities	-	-	-	-	-	-
Government securities	35	23	33	42	20	22
Book-entry system:						
Equity securities	694.0	713.6	625.8	539.0	816.0	1029.0
Government securities	10,666	27,002	58,647	51,071	66,817	80,469

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

Table 14: Number of participants in selected payment and settlement systems

	2006	2007	2008	2009	2010	2011
BAHTNET	65	67	69	65	66	64
ECS	40	40	40	38	38	38
Provincial Cheque Clearing	21	22	23	21	22	22
B/C ¹	39	39	39	37	37	37
NITMX Bulk Payment (SMART)	29	33	33	33	33	32
Bond registry system:						
Equity securities	-	-	-	-	-	-
Government securities	247,700	296,867	308,188	633,708	529,237	341,968
Book-entry system:						
Equity securities and						
Government securities	74	77	91	88	89	89

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

¹ Inter-provincial cheques exchanged at the Electronic Clearing House.

Table 15: Number of ATMs

	2006	2007	2008	2009	2010	2011
Total	21,988	25,943	34,796	39,454	44,468	47,759
Bangkok	8,675	9,883	12,624	13,586	14,639	15,099
Central	6,951	8,818	11,871	13,951	15,669	16,658
Northeast	2,069	2,491	3,673	4,370	5,314	6,091
North	2,072	2,274	3,230	3,707	4,304	4,760
South	2,221	2,477	3,398	3,840	4,542	5,151

Source: Bank of Thailand



Table 16: Number of EFTPOS terminals¹

	2006	2007	2008	2009	2010	2011 ^p
Total	206,216	213,675	246,563	227,283	258,248	261,167

Source: Bank of Thailand

¹ Since 2006, data is collected from banks and some credit card companies.

^p Preliminary Data

Table 17: Number of payment cards

	2006	2007	2008	2009	2010	2011
Total	55,698,708	57,929,150	61,798,358	67,631,419	72,627,280	77,818,347
Credit card ¹	10,900,566	12,003,369	12,971,694	13,489,422	14,187,815	15,328,291
ATM card ²	30,845,358	22,632,173	22,560,305	23,438,658	24,308,945	23,756,810
Debit card ³	13,952,784	23,293,608	26,266,359	30,703,339	34,130,520	38,733,246

Source: Bank of Thailand

¹ Data include non-bank.

² Data include Government Saving Bank, Bank for Agriculture and Agricultural Cooperatives and Islam Bank of Thailand.

³ Data include Government Saving Bank.

Table 18: Use of postal payment instruments. Volume of transactions (in millions)

	2006	2007	2008	2009	2010	2011
Postal payments total	34.69	34.45	33.69	30.62	29.00	28.40
Domestic money order total ¹	33.77	33.83	33.19	30.21	28.65	28.12
Domestic postal order	0.86	0.58	0.46	0.38	0.33	0.26
Postcheque ²	-	-	-	-	-	-
International money order	0.03	0.02	0.02	0.02	0.01	0.01
Incoming	0.03	0.02	0.02	0.02	0.01	0.01
Outgoing	neg.	neg.	0.00	0.00	0.00	0.00

Source: Thailand Post Co., Ltd.

¹ Data include domestic money order and Pay at Post.

² Postcheque has been terminated since 2002

Table 19: Use of postal payment instruments. Volume of transactions (billion baht)

	2006	2007	2008	2009	2010	2011
Postal payments total	107.06	107.91	110.04	98.52	92.24	91.35
Domestic money order total ¹	105.61	106.71	108.86	97.52	91.49	90.67
Domestic postal order	0.19	0.14	0.12	0.10	0.08	0.07
Postcheque ²	-	-	-	-	-	-
International money order	0.63	0.53	0.53	0.45	0.34	0.31
Incoming	0.62	0.52	0.53	0.44	0.33	0.30
Outgoing	0.01	0.01	0.01	0.00	0.01	0.00

Source: Thailand Post Co., Ltd.

¹ Data include domestic money order and Pay at Post.

² Postcheque has been terminated since 2002

Table 20: Sources of payment revenues of Thai commercial banks (million baht)

	2006	2007	2008	2009	2010	2011 ^P
Total	36,291	39,858	44,720	49,568	55,324	60,362
Credit card	9,792	11,202	12,934	13,451	15,562	19,868
ATM card and e-banking	9,976	10,710	12,430	16,539	18,477	20,903
Money transfer and collection	11,711	12,977	14,310	15,148	16,516	14,466
Securities custodian	756	820	856	815	958	1,138
Cheque-related fee	1,965	2,269	2,365	2,128	2,164	2,098
Letter of credit	2,091	1,880	1,825	1,487	1,647	1,889

Source: Bank of Thailand

^P Preliminary Data

Table 21: Sources of payment revenues of foreign bank branches (million baht)

	2006	2007	2008	2009	2010	2011 ^P
Total	2,955	3,146	2,990	3,977	4,425	5,047
Credit card	873	1,083	1,218	2,356	2,564	2,945
ATM card and e-banking	59	59	57	46	47	49
Money transfer and collection	763	772	919	874	913	1025
Securities custodian	732	753	611	577	650	727
Cheque-related fee	244	239	19	15	129	130
Letter of credit	284	240	166	109	122	171

Source: Bank of Thailand

^P Preliminary Data

Table 22: Daily averages of BOT payment services. Volume of transactions (transactions)

	2006	2007	2008	2009	2010	2011
BAHTNET ¹	6,997	7,206	7,716	8,251	9,600	11,272
ECS	252,858	240,924	231,334	221,919	222,578	215,356
Provincial Cheque Clearing	65,574	61,453	58,663	59,065	60,053	61,054
B/C ²	27,630	27,141	26,911	27,216	27,795	27,713
NITMX Bulk Payment (SMART)	70,255	71,704	76,819	85,972	102,074	115,291

Source: Bank of Thailand

¹ Data include inter-bank funds transfer, third party funds transfer, DVP/RVP for securities, Multilateral Funds Transfer and Bilateral R/P.

² Inter-provincial cheques exchanged at the Electronic Clearing House.



Table 23: Daily averages of BOT payment services. Value of transactions (billion baht)

	2006	2007	2008	2009	2010	2011
BAHTNET ¹	583	744	1,110	2,015	2,705	3,164
ECS	112	121	136	125	125	132
Provincial Cheque Clearing	10.8	10.9	11.2	11.4	13.0	14.5
B/C ²	1.4	1.4	1.5	1.5	1.6	1.8
NITMX Bulk Payment (SMART)	3.3	3.2	3.3	3.6	4.5	5.8

Source: Bank of Thailand

¹ Data include inter-bank funds transfer, third party funds transfer, DVP/RVP for securities, Multilateral Funds Transfer and Bilateral R/P.

² Inter-provincial cheques exchanged at the Electronic Clearing House.

Table 24: Peak day figures of BOT payment services. Volume of transactions (transactions)

	2006	2007	2008	2009	2010	2011
BAHTNET ¹	13,421	11,488	11,969	12,898	18,542	18,581
ECS	590,830	514,286	495,463	473,362	547,686	515,908
Provincial Cheque Clearing	141,274	129,731	115,119	111,561	131,468	127,070
B/C ²	124,162	120,434	125,038	122,138	122,979	125,934
NITMX Bulk Payment (SMART)	300,353	322,497	361,746	314,828	350,156	359,198

Source: Bank of Thailand

¹ Data include inter-bank funds transfer, third party funds transfer, DVP/RVP for securities, Multilateral Funds Transfer and Bilateral R/P.

² Inter-provincial cheques exchanged at the Electronic Clearing House.

Table 25: Peak day figures of BOT payment services. Value of transactions (billion baht)

	2006	2007	2008	2009	2010	2011
BAHTNET ¹	1,378.4	1,236.6	1,820.6	2,829.3	4,193.3	5,002.9
ECS	217.2	247.4	296.3	252.4	292.8	259.1
Provincial Cheque Clearing	18.3	20.3	20.9	19.1	22.6	23.3
B/C ²	4.7	4.9	5.7	5.3	5.9	6.5
NITMX Bulk Payment (SMART)	25.5	14.6	15.0	16.8	15.7	13.2

Source: Bank of Thailand

¹ Data include inter-bank funds transfer, third party funds transfer, DVP/RVP for securities, Multilateral Funds Transfer and Bilateral R/P.

² Inter-provincial cheques exchanged at the Electronic Clearing House.

Table 26: Use of credit cards and debit cards via EFTPOS¹ (Monthly average per card, baht)

	2006	2007	2008	2009	2010	2011
Credit card	3,263	3,331	3,395	3,462	3,766	4,022
Debit card	73	73	75	65	74	174

Source: Bank of Thailand

¹ Domestic and oversea spending of Thai credit cards and Thai debit cards via EFTPOS.

Table 27: Cash withdrawal via ATM (Monthly average per card, baht)

	2006	2007	2008	2009	2010	2011
ATM card	6,063	7,018	6,696	6,459	6,767	7,711
Debit card	7,328	7,051	8,752	8,618	9,165	9,531

Source: Bank of Thailand

Table 28: Use of mobile banking¹

	2006	2007	2008	2009	2010	2011
No. of agreements	133,419	168,434	232,758	257,677	519,450	706,439
Volume of transactions	238,501	228,578	4,670,377	11,107,223	15,884,571	19,941,530
Value of transactions (million baht)	155	112	25,218	63,363	109,816	186,511

Source: Bank of Thailand

¹ Data include mobile banking transactions using credit cards, debit cards and account numbers.

Table 29: Use of internet banking

	2006	2007	2008	2009	2010	2011
No. of agreements	2,139,325	3,135,502	4,009,907	3,165,663	4,822,947	5,626,233
Volume of transactions ¹	15,488,741	21,220,469	31,375,931	49,368,820	60,793,740	83,841,394
Value of transactions (billion baht)	3,584.0	4,896.5	5,073.0	5,692.6	7,891.7	8,779.7

Source: Bank of Thailand

¹ Enquiry transactions were excluded.

Table 30: Use of ORFT interbank retail funds transfer (Online Retail Funds Transfer: ORFT)

Volume of transactions (in thousands)

	2006	2007	2008	2009	2010	2011
Total ORFT	43,279	61,234	87,225	84,265	98,618	109,936
ATM	41,079	55,966	79,047	76,214	89,456	99,926
Counter	2,200	5,267	8,177	8,051	9,162	10,010
Internet banking ¹	nav.	nav.	nav.	6,656	10,941	15,342

Sources: National ITMX Co., Ltd. and Processing Center Co., Ltd.

¹ Data collected since 2009.

Table 31: Use of ORFT interbank retail funds transfer (Online Retail Funds Transfer: ORFT)

Value of Transactions (billion baht)

	2006	2007	2008	2009	2010	2011
Total ORFT	293	427	606	583	721	855
ATM	270	349	478	453	549	642
Counter ¹	23	78	128	130	172	213
Internet banking ²	nav.	nav.	nav.	64	111	165

Sources: National ITMX Co., Ltd. and Processing Center Co., Ltd.

¹ Data collected since 2006.

² Data collected since 2009.

Table 32: Bill payment at bank counters. Volume of transactions (in thousands)						
	2006	2007	2008	2009	2010	2011
Total bill payment ¹	66,889	72,372	77,309	84,352	81,700	80,957
Cash	58,806	69,135	74,011	80,884	77,839	77,295
Cheque	1,457	1,791	1,829	1,564	1,629	1,604
Others	6,626	1,446	1,468	1,905	2,231	2,058

Source: Bank of Thailand

¹ Data collected from banks since 2006.

Table 33: Bill payment at bank counters. Value of transactions (billion baht)						
	2006	2007	2008	2009	2010	2011
Total bill payment ¹	3,909	5,069	6,093	4,714	5,296	5,439
Cash	898	1,362	2,586	1,688	1,854	1,961
Cheque	1,904	2,129	2,584	1,934	2,110	2,597
Others	1,107	1,578	923	1,092	1,333	882

Source: Bank of Thailand

¹ Data collected from banks since 2006.

Table 34: Use of e-Money ¹						
	2006	2007	2008	2009	2010	2011
No. of cards/accounts	3,190,135	3,689,484	5,477,324	7,667,215	11,483,751	13,804,253
Volume of transactions	23,644,155	75,642,216	77,953,841	103,007,328	221,458,769	348,197,980
Value of transactions (million baht)	5,532.4	8,660.9	8,383.1	10,549.0	17,742.9	24,732.8

Source: Bank of Thailand

¹ Data collected since 2006 and excluded top-up cards.

Table 35: Fraud through specific payment channels and payment instruments ¹ (million baht)						
	2006	2007	2008	2009	2010	2011
Total fraud	345	620	519	793	186	150
Payment channels ²	90	389	315	561	44	34
Payment instruments ³	254	231	204	232	142	116

Source: Bank of Thailand

¹ Data collect from banks, some special financial institutions and some credit card companies since 2006.

² Banks report only final result. Fraud through specific payment channels include phone banking, mobile banking, internet banking pass book and other channels.

³ Banks report only final result. Fraud via specific payment instruments include cheque, credit card, ATM card, Debit card prepaid card and other cards.



7. Notes of statistical tables

Symbols used in tables	Meaning
"-"	No data
"nav."	Data not available
"neg."	Negligible in value compared to all other data in the same table
"0"	Zero or near zero in value

Table 1 • Gross Domestic Product expressed in current prices

- Using the average foreign exchange rate

Tables 6-7

- Data on cheque transactions since 2006 includes both intra-bank/in-house and inter-bank cheques and is compiled from all commercial banks as well as three Specialized Financial Institutions.
- Credit transfer data refers to pre-authorized intra-bank direct credit funds transfers.
- Debit transfer data refers to pre-authorized intra-bank direct debit funds transfers
- BAHTNET data consists of data relating to inter-bank funds transfers, third-party funds transfers, DVP/RVP securities transfers and multilateral funds transfers.
- Data on credit card spending includes information on non-bank credit cards
- Data on volume of credit card transactions includes bank card, affinity cards, non-bank cards/affinity cards, and foreign credit cards used in Thailand

Table 9

- Excludes data on the number of accounts and outstanding amounts held by Bank of Thailand's regional offices





- Tables 10-11
- Data on bills for collection (B/C) refers only to bills for collection delivered to the Electronic Clearing House in Bangkok
 - BAHTNET data includes data relating to inter-bank funds transfers, third-party funds transfers, DVP/RVP securities transfers and multilateral funds transfers
- Tables 12-13
- Equity securities settlements are processed via scripless book-entry system only
- Table 16
- Data on the number of EFTPOS terminals since 2006 represents information consolidated from commercial banks and some credit card companies
- Table 17
- Data on the number of credit cards includes non-bank credit cards
- Tables 18-19
- Data on domestic money orders includes all domestic postal orders and Pay at Post transactions
- Tables 22-25
- Data on bills for collection (B/C) refers only to bills for collection delivered to the Electronic Clearing House in Bangkok
 - BAHTNET data includes data relating to inter-bank funds transfers, third-party funds transfers, DVP/RVP securities transfers and multilateral funds transfers
- Table 26
- Average monthly spending via EFTPOS within and outside Thailand of domestically issued debit and credit cards
- Table 29
- Data on Internet banking transactions does not include enquiry transactions
- Table 34
- Electronic money data does not include data on prepaid mobile cards
- Table 35
- Data collected from commercial banks and some credit card companies

