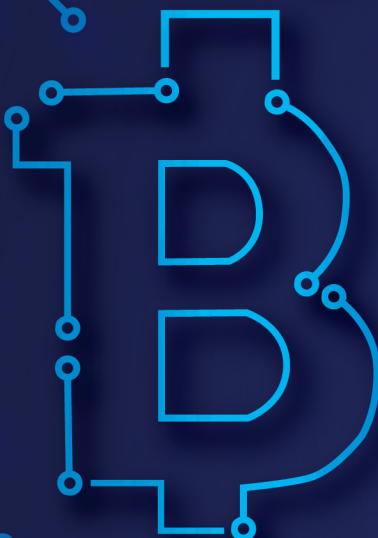




BANK OF THAILAND



DIGITAL PAYMENT

IS TO BE THE MOST
PREFERRED CHOICE



Payment Systems Report

2018





BANK OF THAILAND

Payment Systems Report 2018

Executive Summary

The year 2018 was a transition period from the Third Payment Systems Roadmap to the Fourth Payment Systems Roadmap. Achievements from the previous three Payment Systems Roadmaps had laid strong foundations for payment systems in Thailand that are efficient, secure, safe, and in compliance with international standards. To ensure continuity in the development directions, the Bank of Thailand (BOT) therefore formulated the Fourth Payment Systems Roadmap setting out a framework for the next phase of the payment systems development (2019 - 2021). The main development goal is to promote digital payments to be the most preferred payment option through the creation of an ecosystem that truly meets payment users' needs. The Roadmap consists of five strategic development initiatives, which include:

- **Developing interoperable infrastructure** to foster innovations and competitions such as adopting the ISO 20022 international message standard to facilitate the transmission of payment and business data to meet the needs for data connectivity of the business sector.
- **Fostering payment services innovations (Innovation)** to better meet consumer needs, such as encouraging the PromptPay services enhancement to better respond to the business sector needs and improving cross-border payments and funds transfer services with the interoperable QR Code.
- **Promoting access to and use of digital payment services (Inclusion)** such as encouraging increased digital payment usages among government agencies and state enterprises that often transact with the general public.
- **Strengthening supervision and risk management (Immunity)** to ensure secure and safe payment systems such as advocating adoptions of international security standards to increase readiness for cyber risks responses.
- **Enriching payment data (Information)** by promoting payment data connectivity and data integration among various agencies and encouraging different utilizations of payment data.

Over the years, the BOT has continually driven the development of Thailand's payment systems towards the digital payment society. In 2018, a noteworthy change in the Thai payment systems was the cancellation of digital fund

transfers fees by commercial banks. The fee elimination equipped the public with a low-cost option for payment and financial service, resulting in increasing adoptions of mobile banking and internet banking services with the volume of transactions in 2018 grew more than 42 percent, compared to last year.

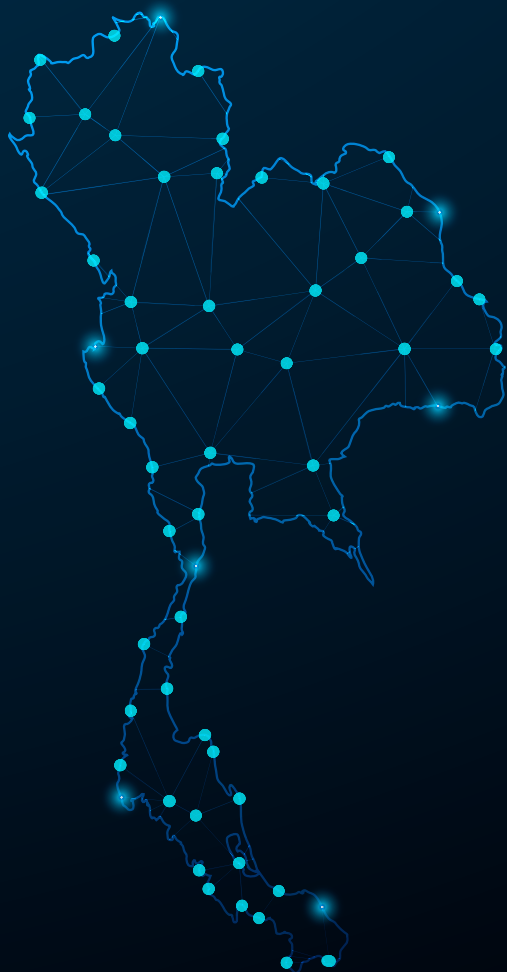
Another important event in 2018 was the BOT's participation in the Financial Sector Assessment Program (FSAP) conducted by the International Monetary Fund (IMF) and the World Bank. The assessment scope also included the national Systemically Important Payment Systems (SIPS). The BAHTNET system, operated by the BOT, was one of the systems undergoing the assessment. The assessment results in terms of operations and risk management of the BAHTNET system concluded that 16 items were at a very good level, and 1 item was at a good level. As for the assessment of the responsibilities of the central bank in supervising the payment system, the BOT was rated at a very good level in all 5 items. The results indicated that the BAHTNET system operated satisfactory and under strong supervision in compliance with international standards, which will strengthen confidence in the Thai payment system at a global level.

Connecting Thailand's payment systems with those of other countries is another top priority for the BOT. Over the years, the BOT continued to promote ASEAN Payment Connectivity through innovative real-time funds transfer and interoperable QR payment services to allow the Thais and the people of ASEAN to access funds transfer and payment services at an affordable fee thereby increasing financial services access.

Notwithstanding steady progress on Thailand's payment systems owing to the joint effort by all sectors, both public and private as well as international cooperation, Thailand's payment systems still need to continue its development journey under the fourth Roadmap to create an enabling ecosystem conducive for advancing digital payment to be the preferred payment option, which will be a key propeller of Thai economic growth and sustainable economic well-being.

Vision

Digital Payment is to be the most preferred choice in efficient, safe, low-cost payment systems that meets users' needs



Payment Systems Committee [PSC]

is one of the main committees of the Bank of Thailand and is responsible for formulating policies on payment systems for the Bank of Thailand that is consistent with business developments and technological advancement.





BANK OF THAILAND

Payment Systems Committee



Chairman
Mr. Veerathai Santiprabhob
Governor



Vice Chairman
Mr. Ronadol Numnonda
Deputy Governor
Financial Institutions Stability



Committee Member
Mr. Paiboon Kittisrikangwan
Deputy Governor
Corporate Support Services
and Banknote Management



Committee Member
Mr. Predee Daochai
Chairman, the Thai Bankers'
Association



Committee Member
Mr. Vuttikrai Leewiraphan
Director General
Department of Business Development



Committee Member
Mr. Sak Segkhoonthod
Digital Transformation
Consultant,
Electronic Transactions
Development Agency



Committee Member
Mr. Auttapol Rerkpiboon
Chief Operating Officer,
Downstream Petroleum
Business Group
PTT Public Company Limited



Secretary
Miss Siritida
Panomwon Na Ayudhya
Payment Systems Policy
and Financial Technology Group

As of 30 June 2019





Key Payment Statistics in 2017 – 2018

	2017	2018	
Total population	66.2	66.4	Million
Nominal Gross Domestic Product (GDP)	15,724.9	16,353.1	Billion Baht

Technological Infrastructure

Number of fixed-line telephone numbers	4.0	4.4	Numbers per 100 persons
Number of mobile phone subscribers	183.6	188.4	Numbers per 100 persons

Payment Statistics

Number of Thai commercial bank branches	6,766	6,717	Branches
Number of Foreign commercial bank branches	18	18	Branches
Number of 6 Specialized Financial Institutions branches	2,471	2,475	Branches
Number for Automated machines [ATMs/CDMs] ¹	66,944	65,976	Terminals
Number for EFTPOS terminal ²	708,976	870,199	Terminals
Number of ATM cards	18,380,892	17,390,984	Cards
Number of Debit cards	59,031,738	62,067,200	Cards
Number of Credit cards	20,571,634	22,074,802	Cards
Currency in circulation per capita	21,719.15	22,652.60	Baht per person
Average cheque usage per capita	1.7	1.7	Cheque per person per year
Monthly average value of credit card payments ³	5,081	4,955	Baht per card
Monthly average value of cash withdrawals via ATM card	4,764	4,154	Baht per card
Monthly average value of debit card payments ⁴	224	241	Baht per card
Monthly average value of cash withdrawals via debit card	10,679	9,798	Baht per card

¹ Automated machines include Automated Teller Machines (ATMs) and Cash Deposit Machine (CDM)

² EFTPOS (Electronic Funds Transfer at Point of Sale) or EDC (Electronic Data Capture) terminals are machines that banks or service providers install at retailers to transmit payment transactions made via debit and credit cards

³ Refers only payments for goods and services made with domestically issued credit cards at EFTPOS terminals in Thailand and overseas.

⁴ Refers only to payments for goods and services made with domestically issued debit cards at EFTPOS terminals in Thailand and overseas.



ธนาคารแห่งประเทศไทย

PAYMENT IN THAILAND

No. of bank branches



2017 9,255

2018 9,210

● 2017

● 2018

No. of ATM cards



2017 18,380,892

2018 17,390,984

No. of Debit cards



2017 59,031,738

2018 62,067,200

No. of Credit cards



2017 20,571,634

2018 22,074,802

No. of EDCs



2017 708,976

2018 870,199



Digital Payment is to be the most preferred choice

Mobile/ Internet Banking



No. of accounts
[Million accounts]

Total volume
[Million transactions]

Total value
[Billion Baht]

2017

51.7

1,476.7

32.5

2018

68.5

3,146.7

44.0

Growth
rate

32.5%

113.1%

35.4%

PromptPay

Registrations



2017

37,094,668

2018

46,554,729

Registered with Citizen ID

2017

25,764,752

2018

29,314,279

Registered with Mobile phone number

2017

11,240,054

2018

16,842,898

QR code

No. of Point of sale



2018

~3,000,000



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The background of the slide features a glowing digital network structure composed of numerous interconnected nodes and lines, resembling a complex web or a data flow diagram. A human hand is visible on the right side, with the index finger pointing towards the network. The overall color scheme is dark blue with bright yellow and white highlights from the network nodes.

Key Payment Systems Development in 2018

- I. The Fourth Payment Systems Roadmap [2019-2021]
- II. Achievements in Payment Infrastructure Development under the National e-Payment Master Plan
- III. Development and Promotion of Interoperable QR Payments for Domestic and International Payments
- IV. Building Confidence in Electronic Payments



I. The Fourth Payment Systems Roadmap (2019-2021)

The BOT has formulated the Fourth Payment Roadmap laying out the development directions of the Thai payment systems during 2019 – 2021. The Roadmap emphasizes on creating an ecosystem conducive for digital payment to be the most preferred choice payments, fostering innovations and competitions and meeting the needs of different user segments, especially those in the fast-growing e-Commerce and social commerce, including the small and medium enterprise (SMEs) and large businesses. The Roadmap also aims at spurring nationwide digital payment usage. Five key development initiatives outlined in the Roadmap are as follows.





“
The payment systems infrastructure must be open and interoperable to foster innovation advancement and competition while still focus on maintaining system stability and security.
”



1. Development of Interoperable Infrastructure

Modern payment systems infrastructure must be open and interoperable to foster innovation advancement and competition among service providers while maintaining system stability and security. Key development measures under this initiative include:

(1) Increase capabilities and elevate risk management of critical payment systems, i.e., the BAHTNET and the PromptPay as well as the systems of both banks and non-bank payment service providers to facilitate growing volumes and value of transactions to ensure service continuity and efficiency.

(2) Encourage critical payment system operators to adopt the international message standard ISO 20022 to facilitate additional transmissions of payment information such as business data to facilitate innovations and international connectivity.

(3) Implement the biometrics standard for identity verification in the electronic know-your-customer process (e-KYC) to facilitate future payment innovations.

Box 1: ISO 20022 Standard Message Scheme Connecting Thailand to the International Payment Highways

ISO 20022 is an international financial services message standard for various financial transactions between financial institutions, businesses, and government agencies such as payments, securities, trade services, cards, and foreign exchange.

ISO 20022 is capable of handling additional transmitting data, which makes it possible to send other information along with the payment messages such as trading information. The scheme meets the business sector's need for data connectivity and supports an end-to-end e-Business process. ISO 20022 has been adopted by many countries around the world, such as Japan and Australia. Its adoption will help promote greater interoperability between Thai payment systems and those of other countries more conveniently and quickly.



2. Fostering Innovation and Payment Services

Technology and financial innovations have become part of today's lifestyle and present opportunities for the development of convenient and safe financial services at a lower cost. Fostering an ecosystem conducive to innovation advancement and innovative services is, therefore, an important mechanism enabling future payment systems to cater to the needs of different target groups in the public, private, and government sectors. Key actions under this initiative include:

(1) Encourage financial institutions to test each innovation in their own sandbox to increase business opportunities to address consumer needs at a faster pace.

(2) Promote pilot projects in partnership with the public and private sectors for the implementation of end-to-end e-Business processes and digital payment to reduce costs and increase operational efficiency.

(3) Support adoptions of various technologies in the development of payment services such as contactless payment, an alternative service in place of cheque, cross-border funds transfer and payments that are convenient, secure and low-cost as well as payment services that help build trust in online shopping, such as a secure / escrow payment facility.



Fostering an ecosystem conducive to innovation advancement and innovative services is an important mechanism enabling future payment systems to cater to the needs of different target groups in the public, private, and government sectors.



BOX 2: Shopping Online at ease with Secure Payment Facility

Currently, e-Commerce has gained increasing popularity. In 2017, Thailand e-Commerce transactions valued at 2.7 trillion baht (source: the Electronic Transactions Development Agency). However, trusts between buyers and sellers remain a significant obstacle to e-Commerce growth as online sellers hesitate to send out products before receiving payments, while buyers are uncomfortable to make payments before receiving the products. The problem is especially heightened for Business-to-Business (B2B) transactions, which often are high-value transactions and involve a large number of business documents, which at present, only a few convenient solutions are available.

For these reasons, countries such as China and the United States have introduced an escrow/secure payment system to enhance consumers' confidence in online shopping. The system acts as a middleman by accepting payments from the buyers and passing them to the seller once the buyer received the correct products. The system has been adopted by various e-Commerce platforms, both domestic and overseas. For instance, China has introduced the escrow payment system on e-commerce platforms, which help enhance buyers' and sellers' confidence and boost e-commerce popularity in the country.



THAI PAYMENTS AT A GLANCE



Public Sector

continued to increase digital payment usages, although the majority still prefer cash.



Government Sector

gave priority to transitioning towards digital payments though with the limited scope.



Private Sector

increasingly migrated to digital payments, although cheque usage remained high due to incomplete end-to-end e-business processes.

3. Promoting Access and Use of Payment Services (Inclusion)

Digital payment development in Thailand will yield the most benefits if it can cater to public needs. It is, therefore, essential to improve access to and widespread use of convenient digital payments to replace cash and cheques usage. Key measures include:

(1) Encourage greater digital payment adoptions by government agencies and state enterprises that frequently transact with the general public to broaden the usage of digital payments.

(2) Reduce related costs of mobile payments to allow people in remote areas to gain access at a lower cost.

(3) Educate consumers on safe practices and correct usage of digital payments and technology through various channels to promote consumer confidence and empower them to choose appropriate services that best serve their needs.



Digital payment must cater to public needs. It is, therefore, essential to improve access to and widespread use of convenient digital payments to replace cash and cheques in addition to foster greater awareness and confidence in digital payment.





4. Strengthening supervision and risk management (Immunity)

Safeguarding system security and sound consumer protection are essential to promote payment systems stability and consumer confidence in electronic financial transactions and payments, particularly today when technologies become increasingly complex and change rapidly. Key actions are:

- (1) Encourage adoption of international cybersecurity standard at both organizational and national levels;
- (2) Build a sound management mechanism and good governance among payment service providers;
- (3) Improve consumer protection;
- (4) Enhance the supervisory framework to be proportionate to nature and risk profile of the business providers (risk-based supervision)
- (5) Adopt the Regulatory Impact Assessment (RIA) principles in policy formulation and revision process to foster innovation and reduce regulatory burdens.

Safeguarding system security and sound consumer protection are essential to promote payment systems stability and consumer confidence in digital payment.



BOX 3 Regulatory Guidelines for Security and Innovation Advancement

Regulatory Impact Assessment (RIA) is a process used to examine and assess impacts that may arise from the issuance of a regulation. The BOT has adopted the RIA concept to improve its supervisory framework and fine-tune its supervision processes to keep up with the current environment in which technology is changing rapidly. Applying RIA on the regulatory issuance or revision process will help reduce regulatory costs posted to financial service providers under the BOT supervision. This in turn will help increase flexibility to exploit the full potential of new technologies, reduce development cycle time and costs, and facilitate the introduction of new financial services. The adoption of RIA will enable the Thai financial sector to quickly adapt to the digital era as well as open up opportunities for financial service innovations that meet the needs of different customer segments, bringing benefits to individual and business consumers.

“Regulations must be flexible and responsive to innovations.”



5. Enriching Payment Information

Data has become a fundamental factor driving the Thai economy towards the digital economy. In this regard, payment data can be utilized in many aspects. For instance, payment data can be used to analyze online stores, while cross-border payment data can be used to evaluate foreign tourists' expenditures. Hence, the BOT emphasizes on proper data management and data integration. Key measures under this initiative include:

(1) Integrate payment data among capable entities to encourage data sharing and provide in-depth information for all parties to utilize under appropriate and rigorous data governance and data privacy measures.

(2) Enhance efficiency in payment data analysis and utilization to foster financial innovation development and support various policy works and supervision.

(3) Promote the adoption of modern technology, such as machine learning, to increase speed and accuracy in data processing. The BOT also focuses on improving quality of existing statistical data in parallel with acquiring new data or developing new indicators and collaborating with government agencies in establishing a micro-data infrastructure necessary for national policy implementation.



In the fast-changing world, data serve as valuable oil resources producing energy driving the economy forward; hence, appropriate data management and data integration become indispensable.



The Fourth Payment Systems Roadmap envisages that in Thailand, there will be an ecosystem conducive for digital payment to become the most preferred option for consumers in every sector, which in turn will increase the convenience and efficiency of financial transactions and reduce transaction costs burdening the public and government sectors. Digital payments will be a catalyst to the growth of SMEs, e-Commerce, and large businesses and enhance Thailand's readiness for international connectivity. Moreover, digital payments will improve the country's competitiveness in pursuit of Thailand's sustainable economic well-being.



BOX4: Case Study – Developments of payment data infrastructure in other countries



At present, many countries have developed payment data architecture to support various utilization by both private and public sectors, for example, the development of products and services that meet customer needs, information-based lending, fraud detection, and using payment data to support regulators' policy formulation and economic analyses. Two notable case studies are provided below.

(1) The United Kingdom has developed payment data architecture, namely the New Payments Architecture (NPA). The NPA aims at promoting competition among payment service providers in their payment innovations. Under the NPA, capable new service providers can enter the market with more ease; and the system security is uplifted to ensure system stability and enable real-time fraud detection. Further, the NPA is designed to comply with data privacy and anti-money laundering laws.

(2) India has developed a centralized infrastructure, namely the Unified Payment Interface, to enable both bank and non-bank services providers and fintech companies to access and utilize data from the same infrastructure. Many mechanisms for data connectivity were created under robust data governance frameworks such as data consent platform and account aggregator service.*

*Account aggregator service collects users' financial data such as deposit accounts and credit card accounts in a single system, allowing users to control and manage their financial transactions more convenient and efficient.



II. Achievements in Payment Infrastructure Development under the National e-Payment Master Plan

The National e-Payment Master Plan has progressed over the past 3 years since receiving the Cabinet's approval on 16 January 2016. The plan aims at transitioning Thai payment systems towards digital payments in an integrated and sustainable manner and supporting faster, more convenient, and more secure financial transactions and economic activities. The plan has been driven primarily by the National e-Payment Strategy Steering Committee, which consists of representatives from both government and private sectors, as well as financial institutions that together help push forward implementations of the plan.

The plan has successfully achieved its objectives and become a starting point for relevant agencies to further advance Thai payment systems in respective to their authorities. The Cabinet, therefore, decided to dissolve the National e-Payment Master Plan Steering Committee on 12 March 2019. Key achievements of the National e-Payment Master Plan initiatives under the BOT's responsibilities can be summarized below.



For more than three years that the National e-Payment Project has been implemented, its intended objectives have been successfully achieved, providing a starting point for relevant agencies to advance Thai payment systems forwards.





- Accumulated PromptPay registered users amounted to 46.5 million as of 31 December 2018, which can be categorized into registration with 29.3 million citizen identification numbers, 16.8 million mobile phone numbers, 71,000 corporate registration numbers, and 304,000 e-Wallet numbers. Compared to the number of PromptPay registered users of 13.0 million in the first month that the registration was opened in July 2016, PromptPay registered users have increased more than 3.5 times.
- The volume of funds transfer via PromptPay since opening totaled at 1.1 billion transactions, equivalent to the value of 5.8 trillion baht (as of 31 December 2018). Additionally, comparing the volume and value of funds transfer via PromptPay in December 2018 with those of the first month (December 2016) revealed that the growth is more than 400 times in volume and more than 1,000 times in value.
- PromptPay infrastructure has generated a variety of extension services. For example, e-Wallet PromptPay which links e-Wallet IDs to bank accounts recorded at 4.4 million cumulative transactions; cross-bank bill payment services totaled at 6.4 million cumulative transactions; and PayAlert services amounted to 164,000 cumulative transactions (as of December 31, 2018).
- The increase of the ceiling on online funds transfer without fees from 50,000 baht to 699,999 baht and the adoption of the standardized Thai QR Code for Payments allowed QR Code to be used by any applications designed for payment functionality and support various payment channels such as bank accounts, credit cards, debit cards, and e-Money accounts.



- The expansion of the electronic payment terminals nationwide resulted in a total of more than 800,000 Electronic Data Capture (EDC) machines and more than 3 million Thai QR Code payment terminals at both general and online stores (as of December 31, 2018). Further, the use of debit cards for payments increased dramatically by 40.2 percent during the first year of the EDC expansion project (March 2017 - March 2018).





Box 5: “Less Cash Society,” an essential step into “Cashless Society.”

“Cashless society” is one of the most mentioned topics today owing to technological advancement that facilitates a variety of digital payment services to satisfy user needs. Further, the advantages of digital payments at both national and business levels (such as reducing cash management costs and fraud) have made a “cashless society” new hope in the digital age. Many countries have issued policies promoting digital payments in an attempt to move towards a cashless society, leading by Sweden, in which cash usage accounted for only 13 percent of the total transaction volume¹.

Although many countries began to pursue a cashless society, trying to change consumer behaviors in a short period is not an easy task. In some countries such as Japan, the cash to GDP ratio remained high at 20 percent (as of 2017)² as Japanese people are still accustomed to using cash. In Thailand, cash usage remained relatively high compared to other developing countries. However, over the past 10 years (2008-2018), even though the cash to GDP ratio remained stable at around 10-12 percent, cash in circulation began to decline from 10 percent during 2008-2013 to 5 percent in 2014-2018. On the other hand, Thai digital payment in the last 10 years rose 6 times starting from 14 times per person per year to 89 times per person per year, indicating that Thai people increasingly migrate to electronic payments, which is consistent with the global trend towards a cashless society. The top 3 most popular e-payment services are (1) mobile funds transfer and payments, (2) e-money payments, and (3) electronic card payments. These trends raise the question of whether Thai payments are at a turning point.

The critical turning point where the Thais began their leaps to digital payments came with the development of the “PromptPay” system along with its various extended services and the online banking fees waiver. This progression is evident with the remarkable increase in the volume of digital payment transactions of more than 85 percent in 2018, comparing to 2016 prior to the introduction of the PromptPay. Nonetheless, stepping towards a cashless society by the Thais remained at an early stage with many challenges ahead, for example, uneven access to financial services and limited financial literacy and digital financial literacy. In addition, cash is still valued and preferred in some consumer segments as cash can always be stored and used even in times of crisis, giving them no incentive to switch to digital payments. Still, even though Thailand has not yet arrived at the cashless society, it is on the path towards a less-cash society. In other words, “cash will remain though digital payment is on the rise.” Continuing on this path requires continual promotions of digital payments that also foster innovation and competition together with improvements in the infrastructure and system architectures supportive of international connectivity, elevated supervision of payment services providers, and educational activities to increase consumer awareness. Simultaneously, improvement must also be made to raise efficiency in cash management, for instance, advocating the shared ATMs to be used by all banks and improving the administration of cash management centers.

¹ Payments patterns in Sweden 2018

² Source: Bank for International Settlements (BIS)



III. Development and Promotion of Interoperable QR Payments for Domestic and International Payments

The BOT has advocated for cooperation among international card network providers such as American Express, JCB, Mastercard, UnionPay International, and Visa, Thai financial institutions, and domestic card network providers and payment service providers in developing and promoting Thai QR Payments standard which is in accordance with the EMVCo international standard. Further, the BOT has pushed for the development of industry practices on customer dispute resolution together with various standards and practices to support open infrastructure and interoperability. The BOT allowed both bank and non-bank service providers to participate in testing these standards in the BOT regulatory sandbox¹ and later launched their services since December 2017.

In 2018, the BOT began phase two of the Thai QR Code Payments standard for credit and debit cards to add domestic and international card payment acceptance points that are convenient, fast, and lower cost for the general public and businesses. The payment security is also uplifted. The cardholders no longer need to show the card or information on the card to the store. At the end of 2018, there were more than 3 million e-Payment acceptance points with the Thai QR Payment functionality available in stores, online, and at various public transportation systems such as public buses and the Bangkok Mass Transit System (BTS).



¹ The regulatory sandbox is a financial service playground for testing financial innovation (FinTech) within the restricted business scope while being monitored by the BOT.



BOX 6: e-Donation Make Merit When You Wish.



The development of electronic donation system (e-Donation) is a collaborative effort between the Revenue Department, Financial Institutions, the National ITMX Company (NITMX), and the Bank of Thailand to enhance accuracy, transparency, and convenience for tax-reductions for donations made to recipients granted the tax benefits under the Revenue Code, such as religious places, hospitals, educational institutions, and other charitable organizations.

The BOT organized the debut of the e-Donation project on 23 July 2018 to promote public awareness and demonstrate its exemplar efforts in enhancing transparency and good governance among donation recipients and the Thai financial sector. The exhibition also explained the simple donation process made through mobile banking applications offered by participating banks. When a user donates via the e-Donation system and requests the information to be sent to the Revenue Department for tax deduction purposes, the donations will be immediately deposited into the recipient's account while information for tax-deductible claims will be simultaneously sent directly to the Revenue Department. The donors no longer need to collect donation documents for subsequent tax filings. The project is one of the extended services of the Thai QR Payments and the PromptPay aiming to increase efficiency in and provide greater benefits to all sectors.

Promotion of Interoperable QR Code for Cross-border Payments

The BOT has encouraged collaborations among CLMV countries and other ASEAN member countries to develop the interoperable QR Code for payments in compliance with the EMVCo international standards to allow future interoperability via mobile payment that became more popular these days. The cooperation has been initiated at the central bank, banks, and non-bank service providers levels to enable cross-border payments and funds transfer services that are efficient, secured, and at affordable costs, which will help expand financial access for the general public. Over the years, key initiatives are:

- The initiation of three Memorandum of Understanding (MOU) on Cooperation in the area of International Payment Systems and Financial Technology, which include: (1) the MOU between the BOT and the National Bank of Cambodia (NBC) signed in February 2019; (2) the MOU between the BOT and the Bank of Lao PDR (BOL) and



(3) the MOU between the BOT and the Bank of Indonesia signed in April 2019 at the meeting of the ASEAN Central Bank Governors in Chiang Rai, Thailand. These MOUs aim to facilitate collaboration in the development of interoperable QR Codes for payments and raise regional cooperation in payments and financial technology. The MOUs also intend to promote concrete use of local currencies and initiate pilot projects on cross-border payments.

- Cross-border linkage via interoperable QR Code for payments between Thai and Singaporean service providers, which was launched in October 2018. The service has allowed Thai and Singaporean customers to make payments in another country via QR code scanning. Similarly, cross-border linkage via Interoperable QR Code for Payments between Thai and Lao service providers will be launched in 2019 to enable Thai and Laotian customers to make cross-border payments by scanning the QR Code.

- Retail payment systems linkages via QR Code between Singapore's Network for Electronic Transfers (NETS) and Thailand's National ITMX Co. Ltd. were established under the MOU signed by both parties at the end of 2018. Furthermore, the BOT and the Monetary Authorities of Singapore have discussed linking the PromptPay system with the PayNow system. The linkage is still under the development and system integration stage and is expected to commence the service in 2020.

- The provision of technical assistance in the development of interoperable QR Code for Payments, cross-border payment, payment systems risk management, and supervision of payment systems and services to other central banks included the Central Bank of Myanmar (CBM), the Bank of the Lao PDR (BOL) and the National Bank of Cambodia (NBC), and the Bangko Sentral ng Pilipinas (BSP).





BOX 7: ASEAN Payment Connectivity Gateway to New World of Payments



ASEAN Payment Connectivity is a result of cooperation between ASEAN member countries. ASEAN central banks, financial institutions, and non-financial service providers all recognize the benefits from the adoption of modern technology and financial innovations in developing interoperable payment systems infrastructure to reduce cross-border payments and funds transfer costs, increase financial access, support tourism, cross-border trade, investment, and labor migration in the region.

At the 5th ASEAN Finance Ministers' and Central Bank Governors meeting during 2-5 April 2019 in Chiang Rai, Thailand, the BOT together with other ASEAN member central banks, financial institutions, and non-financial service providers held a press conference on the international cooperation along with the ASEAN Payment Connectivity exhibition in which details are outlined below.

Cooperation in financial innovations and cross-border payments showcased the interoperable QR Code for Cross-border Payment, which allows tourists to make payments via mobile banking applications by scanning QR Codes for goods and services in Cambodia, Lao PDR, Singapore, and Thailand. The cooperation also highlighted cross-border funds transfer using Blockchain and API technology to enable fast, secure, and lower-cost cross-border funds transfer for individuals and businesses in ASEAN countries. Further, it also illustrated the use of Blockchain technology to improve efficiency in international trade credit transactions by shortening transaction process and increasing transparency by allowing users to check their transaction status.

ASEAN Payment Connectivity Exhibition showcased four innovative technologies offered by financial institutions and payment service providers, which include interoperable QR code for payments, Artificial Intelligence (AI), Biometrics, and Blockchain. These technologies help improve efficiencies of QR Code payments, real-time funds transfer, and the cross-border payment and funds transfer services among ASEAN countries. These services, either under testing or already in service, help improve customers' experiences in many dimensions, such as lower transfer/payment fees, more efficient exchange rate risk management, and more convenient access to financial services.



IV. Building Public Confidence in using e-Payments

Presently, both bank and non-bank payment service providers adopt technologies as the primary mechanism to push their online payment services forwards. However, rapid technological development comes with increasing cyber threats that can cause widespread impacts in a short period. The BOT, therefore, attaches importance to securing payment systems and continuously encourages payment service providers to improve their readiness to cyber threats through the 3-years strategic plan (2017-2019). Key initiatives in 2018 are as follows.

Elevation of cyber resilience readiness and information technology risk management of bank and non-bank payment service providers

The BOT arranged for cyber resilience readiness assessments for major financial institutions and payment service providers in accordance with international standards in 2017. Identified vulnerabilities gaps were subsequently remediated in 2018. Further, the BOT has raised regulatory standards on the supervision and management of IT risks of financial institutions by issuing notifications and guidelines on Regulations on Information Technology Risk of Financial Institutions. The regulation prescribes sound IT governance and requires at least one member of the board to have IT knowledge or experiences. The regulation also prescribes appropriate IT risk governance structure and IT risk and IT security management processes commensurate with the financial institution's risk profile.

Moreover, the BOT conducted examinations on financial institutions' IT risk management according to the above mentioned notifications and guidelines along with examinations on mobile banking service security. As mobile banking has become a main financial service channel with growing usage, the assessments will help reinforce service security, thereby increasing customers' confidence.

Fostering the Financial Sector Cyber Risk Response Cooperation

The BOT advocated and supported ongoing cooperation on cyber risk responses within the financial sector through collaborations with cybersecurity experts and related domestic and international organizations. Key actions are the following:

(1) Ensure that supervisory frameworks on IT risk governance and cyber resilience among regulators of the financial sector are aligned and consistent with international standards to reduce redundancies and regulatory burdens put on the business providers in the financial industry.

(2) Encourage proactive and continuous information sharing at both the financial industry and regulator levels. At the industry level, the exchange of cyber-related information occurred through the Thailand Banking Sector Computer Emergency Response Team (TB-CERT), the Thai Capital Market CERT (TCM-CERT), and the Thailand Insurance CERT (TI-CERT) via efficient, reliable, and secure systems. Further, the BOT also extended cooperation on information sharing to regional regulatory authorities. The BOT has joined the Central Banks, Regulators, and



Supervisory Entities (CERES) Forum to exchange information with other ASEAN regulators and entered into bilateral agreements with other regulatory authorities abroad.

(3) Elevate the financial sector's cyber resilience readiness by requiring major financial institutions and payment service providers to prepare cybersecurity incident response plans and conduct regular exercises at least annually. Furthermore, the BOT in collaboration with various organizations conducted cyber risk response exercises at both banking sector and financial sector levels.

(4) Build cybersecurity capability for the financial industry: The BOT, together with the Thai Institute of Directors Association (IOD), organized seminars and courses on cyber resilience for senior directors in the banking sector. Further, the BOT, in collaboration with the TB-CERT provided technical training workshops on cybersecurity for tactical personnel and organized networking activities to facilitate recruitment of cybersecurity personnel for the financial sector through the Financial Sector Cybersecurity Boot Camp program.

(5) Foster cybersecurity awareness for the general public by organizing the "Bangkok FinTech Fair 2018: SME and Consumer Financial Solutions". The event focused on promoting greater cybersecurity awareness and educating the public on financial innovations and technology, payment systems, and financial service infrastructure. Further, the BOT continuously educated the public on FinTech through various communication channels to cover all population segments.



BOX 8: Financial Sector Cybersecurity Response Exercise...Putting theories into practice.



The BOT, in collaboration with the TB-CERT, arranged for financial institutions cybersecurity response exercises focusing on interlinkages between financial institutions in order to review understandings of roles and rehearsing cyber risk responses in terms of technical, business, and communication procedures in the presence of cyber incidents. The exercise also emphasized information exchange between financial institutions and the TB-CERT and their coordination with the BOT as the regulatory authority to ensure readiness to contain the impacts from spreading wider.

Further, the BOT, together with the Securities and Exchange Commission (SEC), the Office of Insurance Commission (OIC), the Thai Bankers' Association, and the Electronic Transactions Development Agency (ETDA), organized a financial sector cyber incident response exercise for the first time in 2018. The participants included roughly 200 participants from the banking, securities and insurance sectors, business associations, and relevant CERTs. The exercise aimed at building understandings of all concerned parties on the interconnected cyber incident response procedures, ensuring readiness for prompt remedial actions, and enhancing confidence in the Thai financial sector. In this regard, the exercise will be conducted annually.



Digital Payment is to be the most preferred choice





Payment Systems Oversight

- I. Payment Systems Stability
- II. Financial Sector Assessment Program [FSAP]
- III. Related Regulations under the Payment Systems Act B.E. 2560 [2017]
- IV. The oversight and Supervision of e-Payment Service Providers



I. Payment Systems Stability

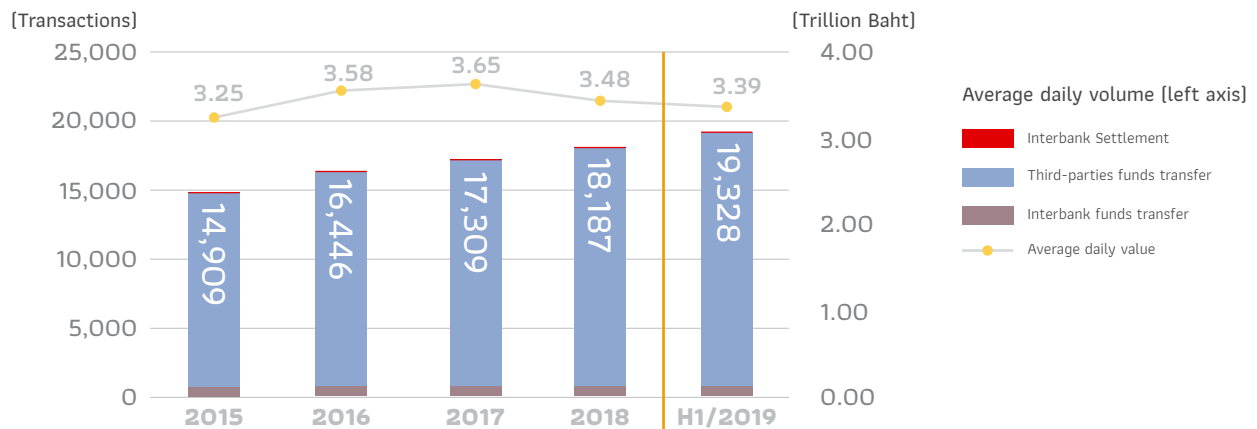
Having secure, safe, and stable payment systems are contributing factors to customers' confidence, which in turn will enable digital payments to be a preferred mean of payment. The BOT, therefore, continuously provides oversight and supervision to payment systems business providers to ensure that the payment systems are secure, safe, having proper risk management and in compliance with international standards, and that any risks that may lead to systemic risk are reduced, leading to payment systems stability, and financial stability. In this regard, the BOT provides supervisory oversight on the Systemically Important Payment System (SIPS), namely the Bank of Thailand Automated High-value Transfer Network (BAHTNET), the BOT operated infrastructure for large-value funds transfers and interbank settlement. The supervisory framework is in line with the Principles for Financial Market Infrastructures (PFMI), an international standard issued by the Committee on Payments and Market Infrastructures (CPMI).

Moreover, the BOT applied the PFMI in overseeing the Prominently Important Retail Payment Systems (PIRPS), namely the Imaged Cheque Clearing and Archive System (ICAS), also operated by the BOT and the Interbank Transaction Management and Exchange (ITMX), operated by the NITMX.

In 2018, e-Payments in Thailand continued to grow steadily. Both high-value funds transfer via BAHTNET and interbank retail funds transfer exhibited an upward trend due to growing electronic funds transfer transactions. Meanwhile, the volume and value of cheque transactions continued to decline. Key trends and risk management of the payment systems operated by the BOT can be summarized as follows.



Figure 1: The average daily volume and value of funds transfer via BAHTNET



Source: Bank of Thailand

Bank of Thailand Automated High-Value Transfer Network [BAHTNET]

Key Trends

BAHTNET is a real-time gross settlement system that facilitates large-value funds transfer between financial institutions. The volume of funds transfers through BAHTNET continued to increase steadily in 2018. The volume of the transactions increased by 5.08 percent from 2017 and averaged at 18,187 transactions per day. The value of funds transfer, on the other hand, shrunk as a result of the decrease in interbank bilateral repurchase operations transactions which has declined significantly since the mid of 2018. The value of funds transfer via BAHTNET in 2018 decreased by 4.74 percent from last year, equivalent to an average of 3.48 trillion baht per day.

The first half of 2019, the average daily volume of funds transfer via BAHTNET still exhibited an upward trend, whereas the value of funds transfer continued to show a declining trend following that of 2018.



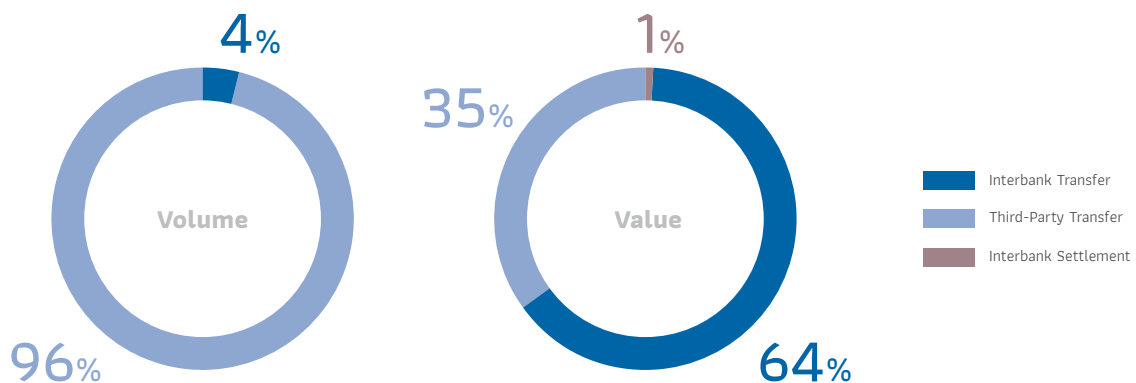
In 2018, the volume of funds transfer via BAHTNET continued to increase steadily. The average daily funds transfer transactions rose by 5.08 percent. Meanwhile, the value of funds transfers declined consistent with the decrease of bilateral repurchase transactions. Such decline was noticeable since the mid of 2018, yielding the decline in the average daily transfers value by 4.74 percent.





A comparison of the volume of funds transfer via BAHTNET by transaction types indicated that 96 percent of total transfers were third-party funds transfer (e.g., businesses, individuals, and non-residents). The average transaction value recorded at 69.34 million baht per transaction. The volume of third-party funds transfer has grown steadily over the past five years, with most transactions worth less than 500,000 baht, representing 51 percent of total transactions. Among these were the third-party funds transfer to or from non-resident accounts. In terms of the transfer value, most BAHTNET transactions were interbank funds transfer, which accounted for 64 percent of total transfer values and averaged at 2,799.97 million baht per transaction.

Figure 2: BAHTNET Transfers by Transaction Types



Source: Bank of Thailand



Management of Material Risks

BAHTNET facilitates high-value interbank transfers and settlement of interbank payment transactions that occurred through retail payment systems such as the ICAS and the ITMX. Each day, these retail payment systems send out members' net settlement positions to be settled in the BAHTNET. Liquidity risk and settlement risk, therefore, are crucial. All BAHTNET members are required to have sufficient liquidity for uninterrupted fund transfers and settlement to avoid any impacts on other members given that insufficient liquidity of a member can lead to systemic risk.

In 2018, members' intraday liquidity provided by opening balances in the Current Account (C/A) averaged at 143.76 billion baht per day and by Intraday Liquidity Facility (ILF) averaged at 394.48 billion baht per day, which is sufficient for BAHTNET real-time funds transfer without incurring settlement risk. Pending transactions, which usually resolved in less than 5 minutes, accounted for 7 percent of total transactions. In terms of the RTGS turnover which derived from the ratio of average daily transfers value to members' daily intraday liquidity, the ratio decreased slightly from 6.80 times in 2017 to 6.46 times in 2018 and continued to trend downward as suggested by the decline of the RTGS turnover in the first half of 2019. Contributing factors were the decrease in the average daily funds transfer value and a higher level of the averaged daily ILF balances maintained by BAHTNET members.

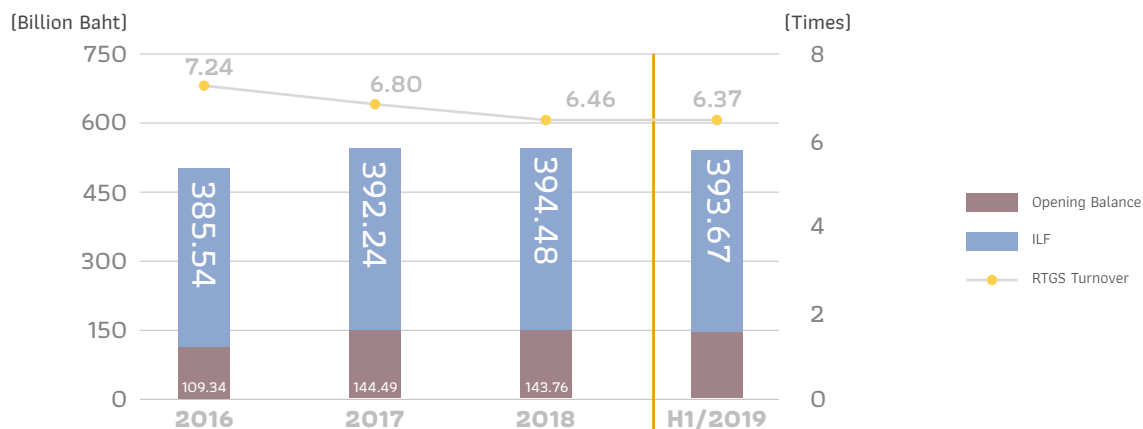


In 2018, commercial banks maintained sufficient liquidity to fulfill interbank funds transfer and settlement obligations without incurring liquidity or settlement risks





Figure 3: Intraday Liquidity and RTGS Turnover



Source: Bank of Thailand

Further, operational risk is another substantial risk in the BAHTNET. The business continuity arrangement is, therefore, vital in supporting the smooth functioning of the system. As the operator and the regulator of the BAHTNET, the BOT established the 2018 target system availability of 99.9 percent. At the end of 2018, the BAHTNET achieved system availability higher than the target. The BOT continually monitors BAHTNET's system availability and regularly reports the results to concerned management and the PSC.



Imaged Cheque Clearing and Archive System: ICAS

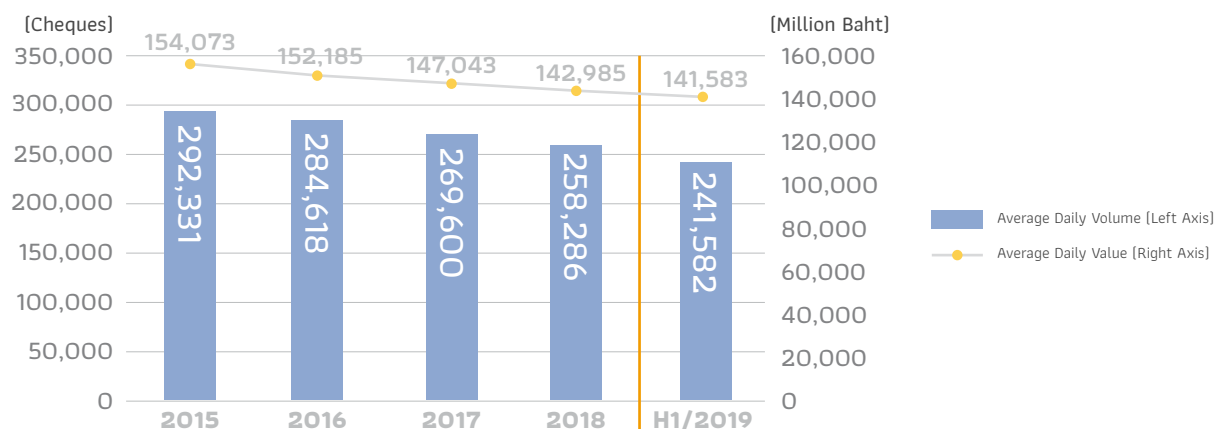
Key Trends

ICAS is an image-based cheque clearing system where cheque images are used in place of physical cheques in the collection process. In 2018, cheque transactions made up the highest proportion of total retail transactions and recorded at 99.40 trillion baht, accounted for 73 percent of total transactions of 136.17 trillion baht. However, in 2018, the average daily volume and value of cheques transactions (both on-us and interbank cheques) declined by 4.20 percent and 2.76 percent, respectively, compared to 2017. These declines were driven by the use of electronic funds transfer in place of cheques. In 2018, the volume of daily interbank cheques averaged at 258,286 cheques per day, equivalent to an average value of 142.98 billion baht per day. Further, the average daily volume and average daily value of interbank cheques in the first half of 2019 suggested that cheques transactions continued to trend downwards.

In 2018, the volume and value of cheques transactions continued to decline as electronic fund transfers became an alternative to cheques. Most cheques transactions [76.12%] were less than 100,000 baht.



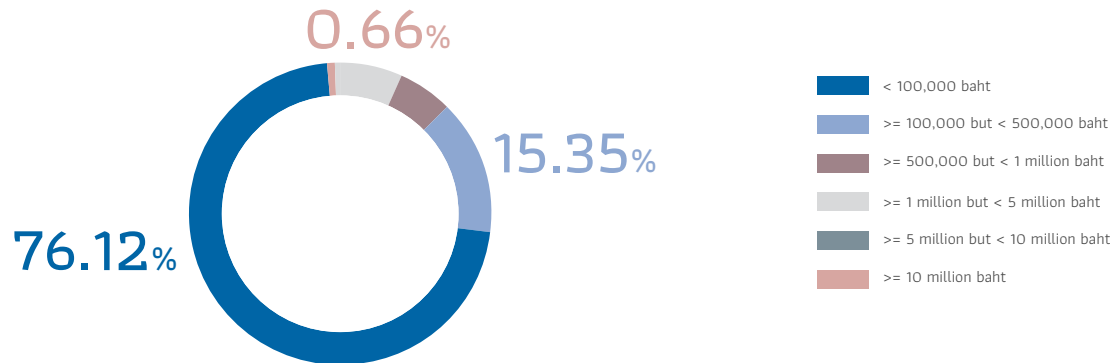
Figure 4: Volume and Value of Nationwide Interbank Cheques



Source: Bank of Thailand



Figure 5: Proportion of Interbank Cheques by Values



Source: Bank of Thailand

In terms of the value of interbank cheques per transaction in 2018, a majority of interbank cheques were less than 100,000 baht in value, representing 76.12 percent of total interbank cheques. This is followed by interbank cheques of between 100,000 – 500,000 baht, equivalent to 15.35 percent of total interbank cheques. Interbank cheques of greater than 10 million baht merely accounted for 0.66 percent of total interbank cheques. Note that, the declining trends in interbank cheques were noticeable among two groups; i.e., interbank cheques of less than 100,000 baht, which dropped 4.42 percent from 2018 (about 9,100 million cheques per day) and interbank cheques of between 100,000 – 500,000 baht, which shrunk by 4.25 percent from 2017 (about 1,762 cheques per day).

Management of Material Risks

The BOT continually managed operational risks and business continuity management of the ICAS, whereby the target system availability in 2018 was set at 99.8 percent. At the end of 2018, the ICAS achieved higher than the target system availability. The BOT continually monitored the ICAS system availability and reported results to concerned management and the PSC regularly.



II. Financial Sector Assessment Program (FSAP)

Over the years, the BOT and relevant authorities in the financial sector had prepared for the FSAP assessment. The scope of the assessment also included the country's Systemically Important Payment Systems (SIPS), which comprised the BAHTNET, operated by the BOT, the Central Securities Depositories (CSD) and the Securities Settlement Systems (SSS), both of which operated by the Thailand Securities Depository Co., Ltd. (TSD). Further, the assessment included evaluation of roles and responsibilities of the supervisory agencies of the Financial Market Infrastructures (FMI), i.e., the BOT and the Securities and Exchange Commission (SEC). This SIPS assessment was conducted at the Full Report on Observance of Standards and Codes (ROSC) level. In other words, the assessment criteria encompassed all items prescribed by the international standards of Principles for Financial Market Infrastructures (PFMI). In this regard, assessors from the IMF and the World Bank conducted the assessment during November 1-16, 2018.

Overview of the BAHTNET assessment results based on the PFMI international standards and the assessment of the BOT as an authority of FMIs are summarized below.

- In terms of operations and risk management of the BAHTNET, the results indicated that the BAHTNET is secure, safe, having adequate risk management, and in compliance with international standards in all aspects. Comparing with the 17 related PFMI principles, the BAHTNET was found to be at the observed level in 16 items and at the broadly observed level in 1 item. The improvement opportunities for the BAHTNET mainly concerned its collateral management framework. For example, the BAHTNET should establish rules and verification process to prevent members from pledging their own securities as collaterals and implement concentration limits for all types of collateral to avoid concentration risk. Other recommendations were to develop an automated collateral management system where liquidity shortage would trigger utilization of the ILF, which will help reduce opportunity costs for participating in the system and encourage members to manage their collateral efficiently. Further, the BAHTNET should take a holistic approach in managing operational risks, i.e., considering a scenario when two or more FMI operators experienced system disruptions at the same time.

- In terms of responsibilities of the BOT as the regulator of FMIs, the BOT received the observed level in all 5 aspects.

In this regard, the IMF and the World Bank published the FSAP assessment report on Thailand on both the IMF² and the World Bank³ websites.

² <https://www.imf.org/external/np/fsap/fssa.aspx>

³ <https://www.worldbank.org/en/programs/financial-sector-assessment-program#4> โดยคลิกเลือก View all และค้นหา Thailand - Assessment of Observance of the CPSS-IOSCO Principles for Financial Market Infrastructures : BAHTNET and TSD (English Only)



WHAT IS FSAP?

FSAP is the financial sector assessment program conducted jointly by the International Monetary Fund [IMF] and the World Bank. The program aimed at assessing the country's financial sector in two parts, namely [1] Financial Stability, and [2] Financial Development.

Participating in the FSAP assessment helps identify strengths and areas for improvements in the financial sector and instigate a robust and progressive financial infrastructure reform. The assessment also helps encourage pertinent regulators to improve supervisory frameworks in keeping with current risk trends and international standards. Further, the assessment helps foster collaborations between domestic and international agencies, enhancing credibilities of and investors' confidence in the Thai financial sector.

More information regarding the FSAP can be found on the IMF website. [<https://www.imf.org/external/np/fsap/fssa.aspx>]





BANK OF THAILAND





III. Related Regulations under the Payment Systems Act B.E. 2560 [2017]

The Payment Systems Act B.E. 2560 (2017) (PSA) and related regulations were in effect since 16 April 2018. The PSA comprises 6 chapters: (1) Highly Important Payment Systems, (2) Designated Payment Systems, (3) Designated Payment Services, (4) Supervision, Examination, and Rectification of Condition or Operation, (5) Appeal, and (6) Sanctions. In 2018, the Ministry of Finance and the BOT issued related notifications on regulations of the payment systems under the PSA as follows:

Notification of the Ministry of Finance

- **Re: Stipulation on Designated Payment Systems:** the notification prescribes characteristics of the designated payment systems as the services that support transactions in the financial systems and overall economic systems of the country, which include (1) Inter-institution Fund Transfer System, (2) Payment Card Network, and (3) Settlement System.

- **Re: Stipulation on Designated Payment Services:** the notification prescribes characteristics and types of the designated payment services that shall obtain a license or a registration certificate, which include (1) Provision of credit card, debit card, or ATM card service, (2) Provision of electronic money service (e-Money), (3) Provision of a service of receiving electronic payment and (4) Provision of a service of transferring money by electronic means.

Bank of Thailand Notifications

The BOT supervisory framework can be divided into three main chapters. There are 18 related notifications of which 2 notifications are under Chapter 1: Highly Important Payment Systems; 3 notifications are under Chapter 2: Designated Payment Systems, and 13 notifications are under Chapter 3: Designated Payment Services. Descriptions of regulatory requirements and their respective notifications in each chapter are summarized below.

- **Chapter 1: Highly Important Payment Systems:** The highly important payment systems characterize as the country's principal payment infrastructure, of which disruptions could result in widespread impacts for its members. Such systems also handle large-value funds transfer or are used for clearing or settlement between members. The highly important payment systems under the BOT's purview include the large-value interbank funds transfer systems (BAHTNET) and the interbank cheque clearing systems (ICAS). Notifications under this chapter prescribe regulations on the supervision of these highly important payment systems regarding payment finality, default management in case a member enter bankruptcy proceedings or being granted a receivership order, and other supervisory requirements such as good governance, risk management, in addition to regulations related to the supervision of members of the highly important payment systems.



- **Chapter 2: Designated Payment Systems:** This chapter prescribes regulations, procedures, and conditions for applying a license for those intending to undertake the designated payment systems business. Examples of such conditions are the qualifications of the business providers and prohibited characteristics of the directors. The regulations also details supervisory requirements such as financial status, governance arrangement, and risk and security management. These requirements intend to ensure that the business providers are credible, possess qualifications as prescribed by laws, operate with a sound financial status and secure services systems, and have in place proper risk management arrangement. In this regard, those intending to undertake the designated payment systems business must apply for a license from the Minister of Finance or register with the BOT before commencing the business.

- **Chapter 3: Designated Payment Services:** Notifications under Chapter 3 prescribes regulations related to the application for a license or a registration to undertake a designated payment services business. For example, the notifications prescribe qualifications of the business provider, prohibited characteristics of the directors, and general regulatory requirements such as financial position, governance, risk management, and security management. The regulations also prescribe specific requirements for those intending to undertake each designated payment service in pursuance to the Ministry of Finance notifications. In this regard, those intending to undertake designated payment services which are widely accessible must apply for a license from the Minister of Finance. Further, those intending to undertake designated payment services with limited scope, utilizing new technology, and are under testing, must register with BOT before commencing the business.

- **Other related notifications:** other notifications prescribe regulations related to the supervision of designated payment business under the Payment Systems Act, for instance, policies and measures on Security of Information Technology Systems Services and the provision of services relating to debit cards issued and used domestically.

The PSA was in effect since 16 April 2018. In this regard, three existing laws were annulled, namely, (1) the Ministerial Notification of Ministry of Finance: Business for which permissions must be obtained according to Section 5 of the Notification of the Revolution Council No. 58 (e-Money businesses); (2) the Royal Decree on Regulating Electronic Payment Service Business, B.E. 2551 (2008); and (3) the Royal Decree on Regulating Electronic Payment Services of Specialized Financial Institutions, B.E. 2559 (2016).



IV. The oversight and Supervision of e-Payment Service Providers

The BOT provides oversight and supervision for designated or registered e-Payment service providers to ensure that e-Payment services are secure, trustworthy, efficient. The supervisory framework also ensures that e-Payment service providers put in place risk management systems in compliance with international standards, maintain strong business continuity management during normal and crisis situations, and implement appropriate consumer protection arrangements.

From 2018 to June 2019, the BOT recommended the Ministry of Finance to grant licenses for 110 payment systems business providers and payment service providers under the Payment Systems Act B.E.2560 (2017), representing a total of 246 licenses issued. Among these were 100 existing business providers who previously operated before the Act came into effect (223 licenses) and 10 new business providers (23 new licenses). At present, the payment business providers comprise 30 financial institutions, 6 specialized financial institutions, 5 foreign juristic persons, and 69 non-bank service providers.

In addition, the BOT issued registration certificates for 3 e-Money service providers with limited scope (for specific goods or services/locations/ business groups), which consisted of 2 non-bank service providers and 1 state enterprise.

The list of payment business providers under the Payment Systems Act can be found on the BOT Website (<https://www.bot.or.th>) under “Payment Systems” > “Payment Systems Act.” > “List of Payment Business Providers.”



Payment Systems Trends

- I. Overview of Payment Services in 2018
- II. Payment Services Channels in 2018
- III. Thai Payment Behaviors

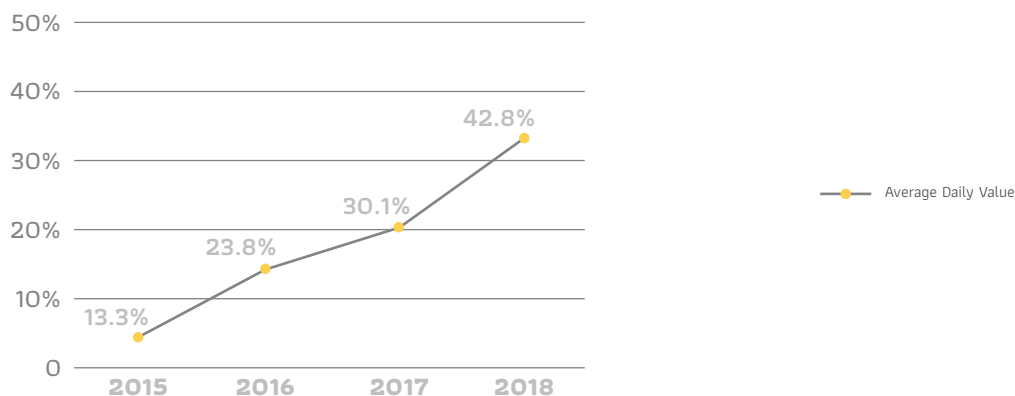


I. Overview of Payment Services in 2018

Over the years, the volume of e-Payment transactions has continually increased. In 2018, e-Payment transactions totaled at 5,955 million transactions, equivalent to a growth of 42.8 percent from the previous year. The main drivers of such drastic growth were the elimination of transaction fees for funds transfer via mobile banking and internet banking by commercial banks, and the active promotion of funds transfer via PromptPay and Thai QR Payments throughout the year. Consequently, people have increasingly switched to mobile banking and internet banking services. Particularly, mobile banking grew at more than 121.0 percent in volume and at 81.4 percent in value compared to 2017.

Analysis of the total number of Thai e-Payment transactions per capita revealed that the proportion rose from 63 times per capita per year at the end of 2017 to 89 times per capita per year at the end of 2018, representing a growth of 41.3 percent. In addition, data in the first half of the year 2019 indicated that Thai e-Payment transactions have further increased to 110 times per capita per year, demonstrating an unceasing growth and a potential for encouraging greater usage.

Figure 6: Growth in e-Payment Transactions Between 2015-2018



Source: Bank of Thailand



Figure 7: Thailand's e-Payment Transactions Per Capita

e-Payment usage in Thailand per person per year [number]

e-Payment Usage per person per year [number]

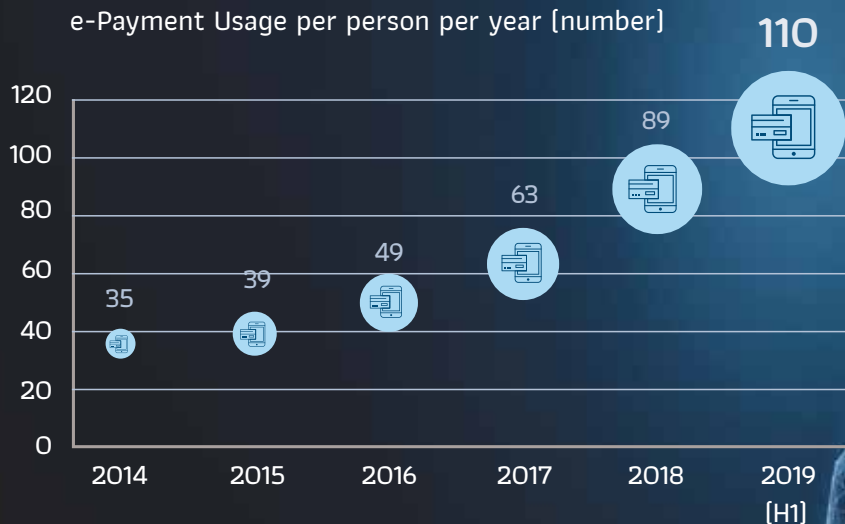


Table 1: Volumes of e-Payment per capita of various countries*

e-Payment usage per person per year [number]*

Singapore



782

Sweden



495

South Korea



500

Australia



497

U.K.



411

Malaysia



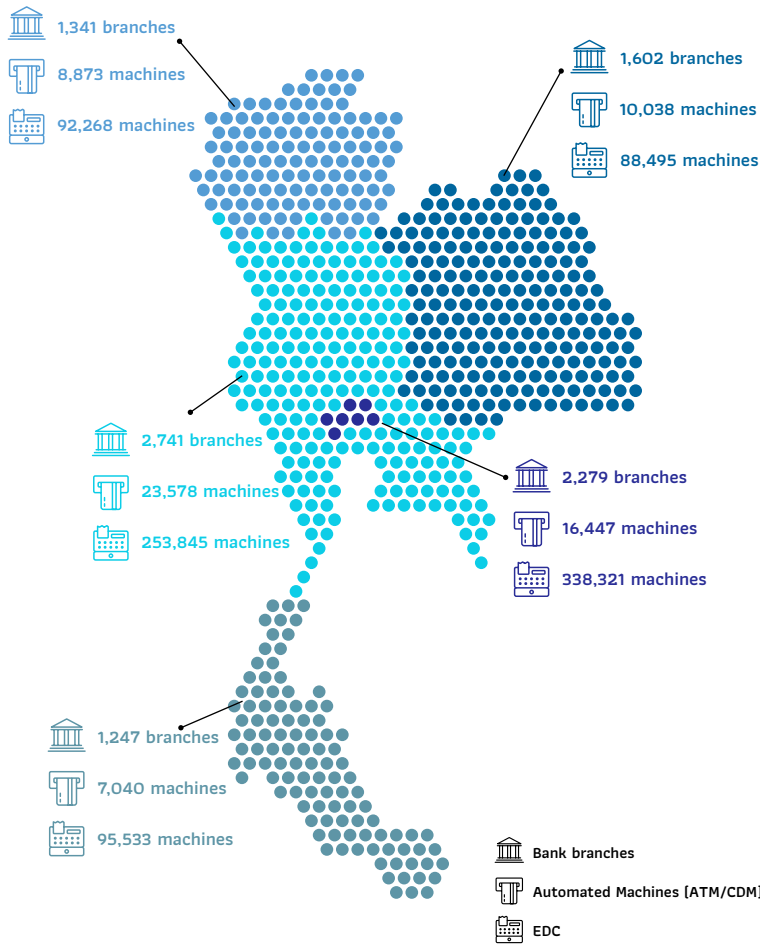
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* End of 2017 data for other countries; End of 2018 data for Malaysia

Source: BIS [2017] Statistics on payment, clearing and settlement systems in the CPMI countries, Bank of Negara Malaysia

II. Payment Services Channels in 2018

Figure 8: Payment Services Channels in 2018



Source: Bank of Thailand

“ In 2018, commercial bank branches continued to decline, especially those in Bangkok. Meanwhile, numbers of ATM/CDM machines declined for the first time as a result of the increasing popularity of mobile banking. ”



Rapid changes in financial technology have made digital payments more accessible and more convenient. The demand for certain types of transactions to be conducted at branches, therefore, decreased. Over the years, financial institutions have adjusted to the changing payment behavior by reducing the number of costly bank branches resulting in the remaining 9,210 bank branches at the end of 2018, decreasing by 45 branches. Note that Thai commercial banks' branches decreased by 49 branches, of which 43 branches were in Bangkok, and those of specialized financial institutions increased by 4 branches.



As for the automated machine (ATM/CDM), as of 2018, ATM/CDM totaled 65,976 machines, decreased for the first time by 968 machines, or a 1.5 percent decrease from the previous year. The reduction of ATM/CDM in Thailand was consistent with the global trend, in which ATM / CDM decreases by 1 percent due to the increasing popularity of mobile banking and the reduction of bank branches. Comparing with other countries, the number of ATM/CDM in Thailand of 993 machines per million inhabitants was close to those of Australia and the United Kingdom, which stood at 1,295 and 1,054 machines per million inhabitants, respectively. Nonetheless, Thailand's ATM/CDM machines per capita could continue to decline due to the advancement in payment innovations, following Sweden and Singapore, whose ATM/CDM were only 262 and 555 machines per million inhabitants, respectively.

Regarding the EDCs, at the end of 2018, the number of the EDCs stood at 870,199 machines, increased by 161,223 machines, or a growth of 22.7 percent from last year. Such growth can be attributed to the promotion of e-Payments through the Card Usage Expansion Project under the National e-Payment strategies, which was launched between 2017 and the first quarter of 2018. The project has led the participating banks to expand the EDCs coverage nationwide.

Compared to other countries, in 2018, Thailand had 13,103 EDCs per one million inhabitants, which was relatively low in comparison to that of developed countries such as Australia, England, Sweden and Singapore; of which the number of EDCs per one million inhabitants was 38,924, 36,600, 21,656, and 45,553, respectively. Hence, the number of EDCs in Thailand is expected to increase over time to facilitate e-Payment usage.

Table 2: Numbers of ATMs/CDMs and EDCs in Various Countries

Unit: Machines per one million inhabitants

	Thailand	Malaysia	Australia	U.K.	Sweden	Singapore
No. of ATM/CDM*	993	N/A	1,295	1,054	262	555
No. EDC*	13,103	16,000	38,924	36,600	21,656	45,553

Source: Statistics on payment, clearing and settlement systems in the CPMI countries - Figures for 2017, Malaysia's Payment Statistics: BNM, Bank of Thailand

*End of 2017 data for other countries; End of 2018 data for Thailand and Malaysia



III. Payment Behaviors

General Public, Businesses, and Government Payments

In 2018, public payments continued to grow steadily. In particular, the volume of public payments transactions grew drastically at 45.7 percent, primarily due to the increasing growth of public spending through mobile banking/internet banking, which continued to expand similar to the year before. This growth can be attributed to the cancellation of fees for funds transfers via mobile banking/internet banking and the continual promotion of PromptPay and Thai QR Payments. Compared to 2017, the volume and value of mobile banking/internet banking transactions grew remarkably at 116.3 percent and 39.8 percent, respectively. Meanwhile, payments and funds transfers via ATM/CDM using electronic cards continued to shrink from the previous year. The contraction was about 15.0 percent in both volume and value as individuals have switched to a more convenient mobile banking/internet banking, that allow them to transact anywhere anytime.



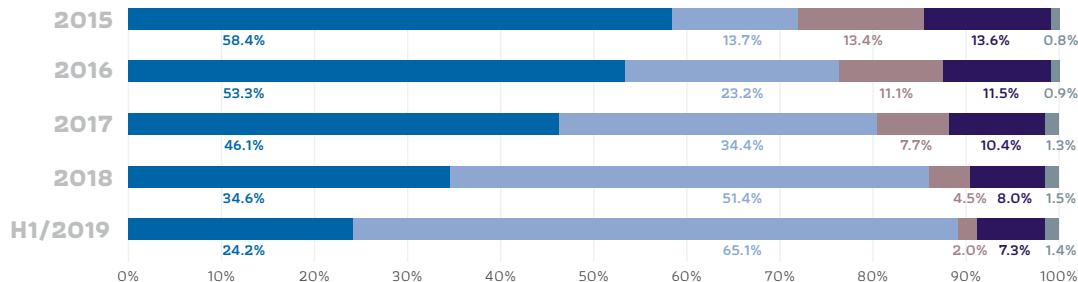
General Public

2018

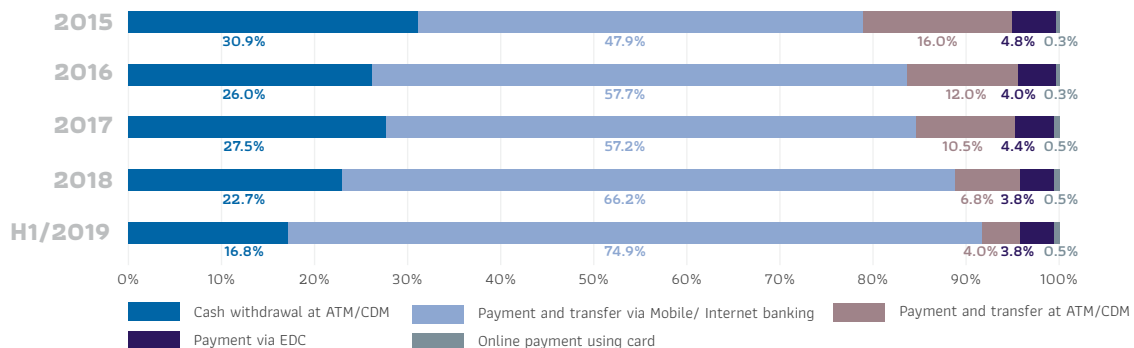
In 2018, the **Volume** of transactions totaled 6.2 billion [+45.7% YoY];
The **Value** of transactions totaled 37.9 trillion baht [+22.1% YoY]."

Figure 9: Proportions of Payments during 2015 – 2019 (H1)

Proportion of Volume



Proportion of Value



Source: Bank of Thailand



Business and
Government
Sectors

2018

In 2018, the **Volume** of transactions totaled 649.6 million [+10.3% YoY]; The **Value** of transactions totaled 109.3 trillion baht [+2.3% YoY].”

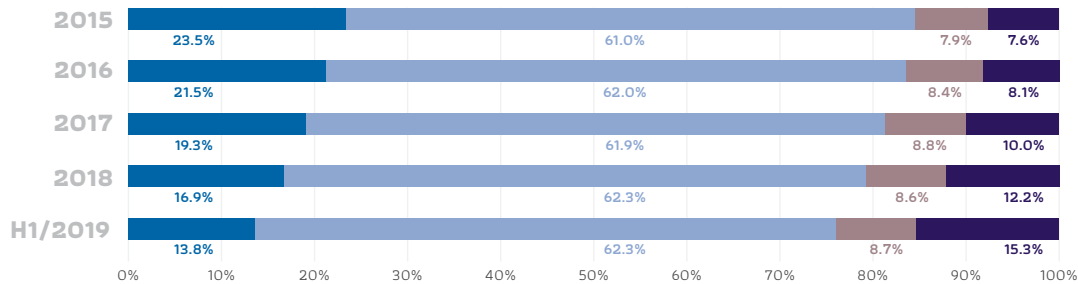
Payments in the business and the government sectors grew slightly in 2018. Nonetheless, compared to other payment channels, transactions via mobile banking/ internet banking showed the strongest growth rate compared to 2017, similar to those of the public sector. Again, this is due to the fees waiver for funds transfers via mobile banking/internet banking. The growth also came partly from commercial banks' continual focus on offering new services to satisfy business needs, especially those of the SMEs. For these reasons, mobile banking/internet banking usage in the business and the government sectors grew at 33.7 percent in terms of volume and 14.8 percent in terms of value compared to 2017.

In contrast, cheque usage continued to fall steadily since 2016. In 2018, the contraction was at 3.6 percent in volume and 4.5 percent in value compared to last year. Comparing cheques usages in the first half of 2019 to those of the same period in 2018, intra-bank cheques and inter-bank cheques usages decreased in both volume and value by 22.9 percent and 9.1 percent, respectively. The decline stemmed from shifting business preference towards e-payments and the government tax refund issued via PromptPay instead of cheque return in 2017. Still, certain businesses required cheque usage in particular circumstances, such as using cheque as collateral for loans or evidence in court. Consequently, cheque usage is expected to decline gradually in the future.

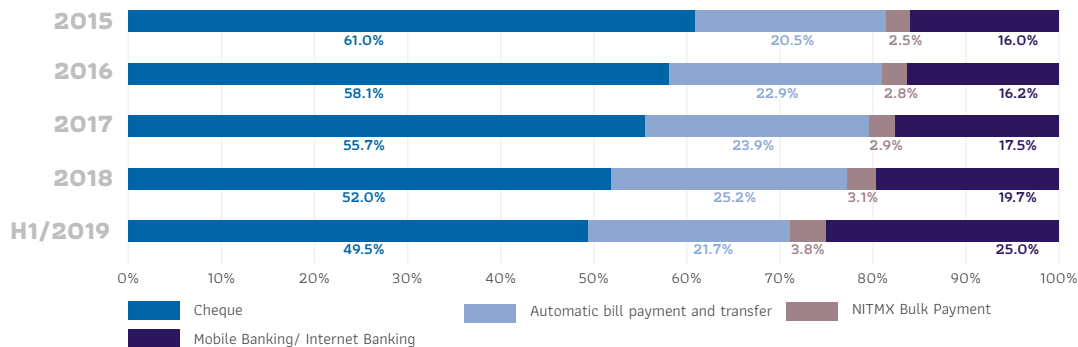


Figure 10: Proportions of Payments during 2015 – 2019 [H1]

Proportion of Volume



Proportion of Value



Source: Bank of Thailand

Cash Withdrawals and Deposits

Cash usage in 2018 largely reflected the Thais habit of withdrawing cash for daily spending. In terms of volume, the Thais generally made withdrawals in small amounts via ATM/CDM machines, which comprised cash withdrawals via in-house machines, cash withdrawals via machines abroad, cash advance via credit cards, and cardless cash withdrawals via machines or mobile applications, recently offered by commercial banks.

In 2018, Thai people withdrew cash via ATM/CDM, on average 32 times per person per year, representing a share of 92.6 percent of total cash withdrawals through various channels. The remaining 7.4 percent were over-the-counter withdrawals. In terms of the volume of cash withdrawals, the growth of over-the-counter cash withdrawals shrunk by 13.7 percent, compared to in the previous year, consistent with the declining trend of bank branches. Meanwhile, cash withdrawals via ATM/CDM increased in frequency, leading to the lower average value per withdrawal.

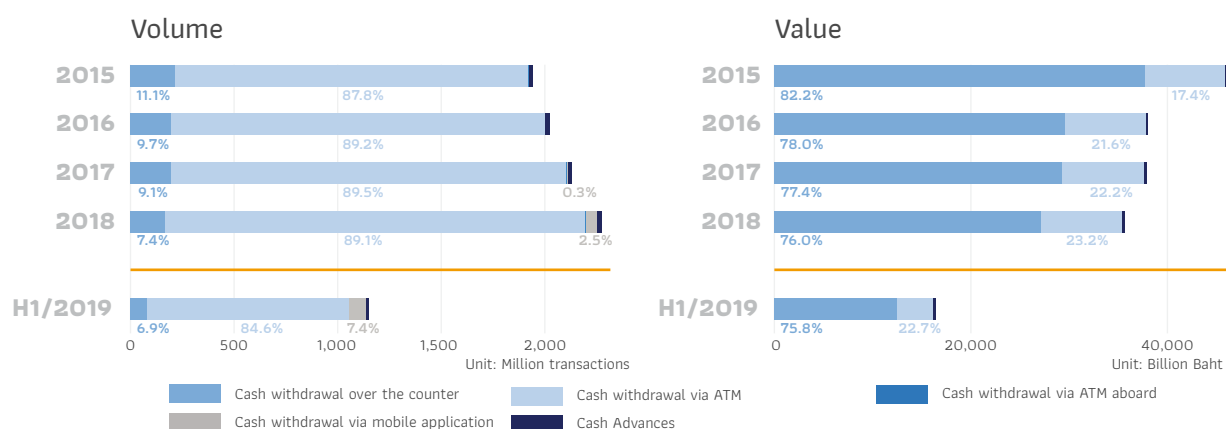
Overall, cash withdrawals and deposits trended downwards, resulting in a decrease in the average value of cash withdrawals via ATM. However, the frequency of withdrawals increased.





Nonetheless, cash withdrawals in the first half of 2019 remained in line with the 2018 trend. Over-the-counter cash withdrawals fell by 3.3 percent, while cash withdrawals via ATM / CDM continually increased by 5.5 percent from the same period last year. This ongoing trend was mainly due to the increasing popularity of cardless cash withdrawals via machine or cash withdrawals via mobile application, which was evident with the average volume of cardless cash withdrawals during the first half of 2019 of 14.2 million transactions per month, equivalent to an increasing proportion of 7.4 percent of the total cash withdrawals from 2.5 percent during the initial launch in 2018.

Figure 11: Volume and Value of Cash Withdrawals in 2015-2019 [H1]



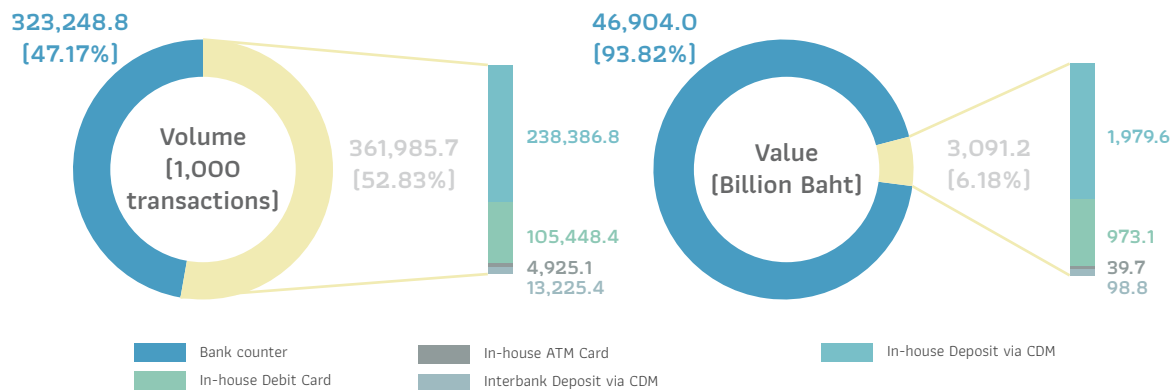
Source: Bank of Thailand

In terms of transaction value, most withdrawals in 2018 occurred over the counter, which accounted for 76 percent of total cash withdrawals and valued at 26,976.2 billion baht, which was 3.2 times higher than the cash withdrawals via ATM/CDM. This preference could be attributed to an ATM/CDM withdrawal limit of 20,000-30,000 baht per transaction, and a maximum daily withdrawal limit imposed variably by bank conditions, as preventive risk measures for both customers and the banks. Thus, in case of a large withdrawal, customers preferred to conduct the transaction over the counter. Consequently, the average value of cash withdrawal over the counter stood at 160,606.7 baht per transaction, while the value of cash withdrawals via ATM/DCM totaled at 8,801.9 billion baht or an average of 4,029.4 baht per transaction, decreased from the last five years average of 4,649.6 baht per transaction.



Cash deposits in 2018 shrank by 5.3 percent from last year, following a 16 percent decrease of the over-the-counter deposits. Such decline was primarily due to public preference for electronic funds transfer over the over-the-counter deposits together with promotions of CDM deposits to replace over-the-counter transactions by banks. The latter was evident with the average number of CDM deposits of 5.5 times per person per year surpassing the over-the-counter deposits of 4.9 times per person per year for the first time. However, in terms of value, Thai customers still preferred to make large deposits over the counter because the CDM deposits imposed a maximum limit of 100,000 baht per transaction, and consumers are more confident in the in-person service than the CDM. This preference was evident with the average value of the counter deposits in 2018 of 145,101.8 baht per transaction, higher than the average CDM deposits of 8,539.4 baht per transaction. As for the first half of 2019, overall cash deposits remained consistent with those of 2018 in that the counter deposits continued to decline, while the CDM deposits trended upwards.

Figure 12: Volume and Value of Cash Deposits in 2018



Source: Bank of Thailand



Electronic Card Usage

In 2018, the total number of electronic cards continued to increase with debit cards exhibiting the highest growth, followed by credit cards. ATM cards, on the contrary, experienced a decline. The high growth of debit cards was owing to commercial banks' increased promotion on the use of debit cards because debit cards can be used for payments at the point of sale and online, in addition to its ATM-like feature. Still, debit cards grew at a decreasing rate. Meanwhile, the number of credit cards continued to grow following commercial banks' payment innovations developed to satisfy consumers' needs and lifestyles. At the end of 2018, the number of debit and credit cards totaled 62.1 million cards and 22.1 million cards, representing a 5.1 percent and an 8.9 percent growth, respectively. During the same period, the number of ATM cards recorded at 17.4 million cards, decreased considerably from the previous year by 5.4 percent.

As of June 2019, the number of debit and credit cards rose to 64.4 million cards and 23.1 million cards, respectively, or equivalent to a growth of 3.8 percent and 4.6 percent, compared to the end of 2018. The increase is in contrast with the number of ATM cards, which decreased steadily to 16.7 million cards or decreased by 4 percent compared to the end of 2018.

Table 3: Number and Proportion of Electronic Cards at the end of 2018, and the growth/decline rate in 2018 [compared to 2017]

Card Types	2018 Number (Million cards)	2018 Proportion [%]	Growth [%] [Comparing 2017 – 2018]	June 2019 Number (Million cards)	June 2018 Proportion [%]	Growth [%] [Comparing Dec 2017 – June 2019]
ATM	17.4	17.1	-5.4	16.7	16.0	-4.0
Debit Cards	62.1	61.1	5.1	64.4	61.8	3.8
Credit Cards	22.1	21.8	8.9	23.1	22.2	4.6
Total	101.5	100.0	3.9	104.2	100.0	2.7

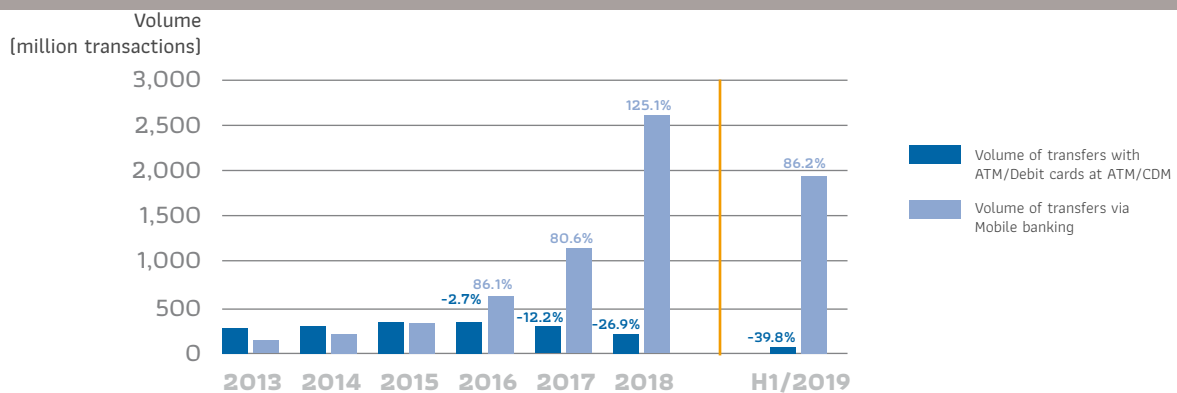


The use of electronic cards for funds transfers and payments via ATM/CDM significantly declined in volume from the previous year. One reason was that Thai people started to adopt a more convenient mobile banking/internet banking for funds transfer and bill payment. Further, the fee waiver for funds transfer via electronic channels, introduced at the beginning of 2018, became a catalyst for the Thais to switch to online channels instead of ATM. The shift from ATM was evident with the drop in volumes of funds transfers using ATM cards and debit cards at the ATM/CDM by 26.9 percent and the substantive 40.2 percent fall of the use of ATM cards and debit cards for payment via ATM/CDM such as bill payments. On the other hand, there were significant growths in funds transfers and payments via mobile banking/internet banking. Funds transfers via mobile banking/internet banking increased 125 percent or 1.25 times from 2017, while payments via mobile banking/internet banking increased by 79.6 percent from the year before.

“The use of cards for transfers/ payments at ATM/CDM declined significantly due to changing consumers’ behavior and the fee waiver of funds transfer via mobile banking/ internet banking in 2018.”



Figure 13: Volume of Funds Transfer via ATM cards and Debit cards at ATM/CDM and Mobile banking



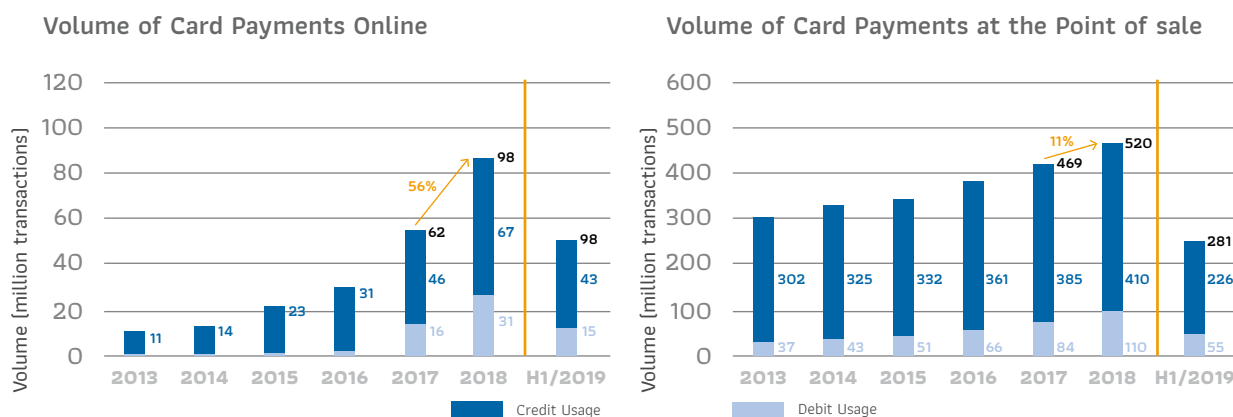
Source: Bank of Thailand



The use of electronic cards for funds transfers and payments during the first half of 2019 was still in line with those of 2018. Funds transfer and payments via ATM/CDM continued to decrease compared to the same period in 2018, with a drop of 39.8 percent and 47.9 percent, respectively. The volume of funds transfers and payments via ATM/CDM registered at 80.1 million transactions, reduced from 134.7 million transactions in the first half of 2018 by 39.8 percent. On the contrary, the funds transfers and payments via mobile banking/internet banking totaled at 2,371.7 million transactions during the first half of 2019, higher than those of the same period in 2018, which recorded at 1,289.2 million transactions, or equivalent to an 86.2 percent increase. Such increase was also the result of the fee waiver for funds transfer transactions and the push for mobile banking/internet banking by the banking sector.

Nonetheless, despite the decline in the use of electronic cards at ATM/CDM, the use of debit and credit cards for payments for goods and services via online channels and at the point of sale in 2018 continued to increase, similar to 2017. The use of electronic cards for payment via online channels grew at 56.1 percent while the use of electronic cards at the point of sale grew at 11 percent from 2017. As for the first half of 2019, the use of debit and credit cards for payments for goods and services via online channels and at the point of sale increased by 31.6 percent and 8.1 percent, respectively. In this regard, credit cards remained the more preferred method for payments for goods and services via online channels and at the point of sale.

Figure 14: Volume of Debit and Credit Card Payments at the Point of sale and Online



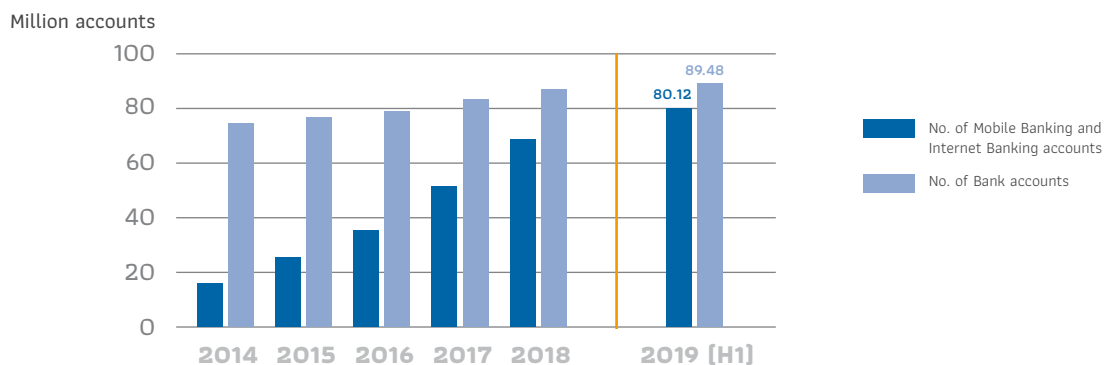
Source: Bank of Thailand



Mobile banking and internet banking

The number of mobile banking and internet banking accounts in 2018 exhibited an uninterrupted growth with an increase of 33 percent from 51.7 million accounts in 2017 to 68.5 million accounts in 2018 and further to 80.1 million accounts in the first half of 2019. Over the past five years, access to payments via mobile banking and internet banking has dramatically increased. The share of bank accounts registered for mobile banking and internet banking rose from 22 percent in 2014 to 77 percent in 2018 and advanced to 90 percent in the first half of 2019.

Figure 15: Number of Mobile Banking and Internet Banking Accounts (Compared to Bank accounts)

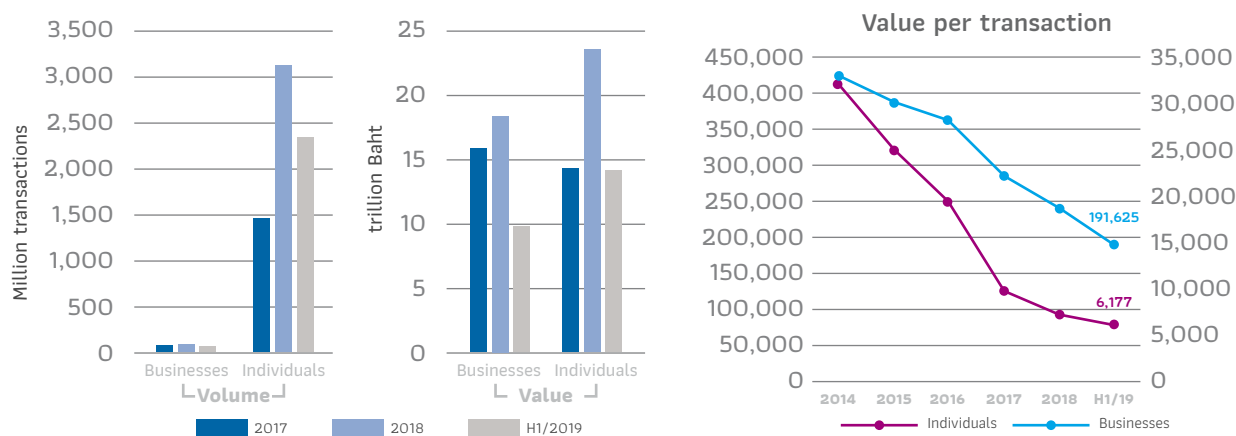


Source: Bank of Thailand

In 2018, the general public showed an increasing preference towards funds transfer and payments via mobile banking and internet banking. The volume of the transactions rose by 116 percent from the same period in 2017. Examining payment behaviors revealed that the value of transfers and payments transactions declined from the same period in 2018 from 10,700 baht per transaction to 7,564 baht per transaction, and continually decreased to 6,177 baht per transaction in the first half of 2019. Such declines suggested that the public become more familiar with payments and funds transfer services via mobile banking and internet banking in their daily life. Likewise, the business sector also turned to online funds transfers instead of using cheques. As a result, the volume of mobile banking and internet banking transactions grew at 38 percent from the same period in 2017. With most transactions being funds transfers for trade, payments for goods and services, and salaries and wages payment, the value of mobile banking and internet banking transactions stood at 241,457 baht per transaction and decreased to 191,625 baht per transaction in the first half of 2019.



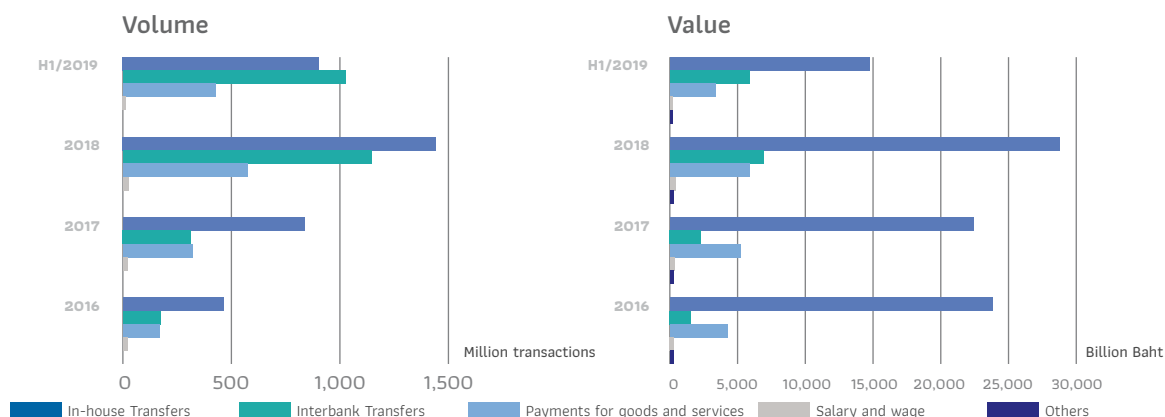
Figure 16: Volume and Value of Internet banking and Mobile Banking



Source: Bank of Thailand

Further, a comparison of the volume of funds transfer transactions by objectives revealed that the volume of on-us funds transfer increased 72 percent from the same period last year. However, the increase was at a slightly decrease rate compared to the previous year because more people had shifted to inter-bank funds transfers since the beginning of 2018 when many commercial banks waived the online transaction fees which were around 25-35 baht, and some banks also waived the fees for transfers between regions, top-ups, and bill payments. Accordingly, more people switched to interbank transfers and payments, resulting in the drastic jumped of interbank funds transfers of 266 percent compared to the previous year and continued the surge by 163 percent in the first half of 2019.

Figure 17: Volume and Value of Internet banking and Mobile Banking Transactions by Objectives



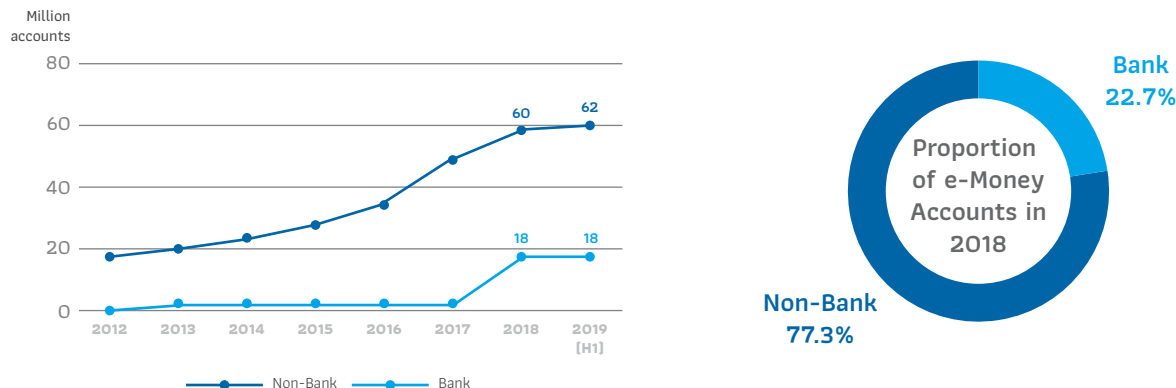
Source: Bank of Thailand



e-Money ⁴

At the end of 2018, there were 24 e-Money service providers⁵ under the Payment Systems Act, consisting of 18 non-bank e-Money service providers and 6 bank e-Money service providers.

Figure 18: Number of e-Money accounts [Bank and Non-bank]



Source: Bank of Thailand

The e-Money service is an electronic payment medium that caters to the needs of the new generation who wants fast and convenient methods for daily expenditures, such as public transportation cards, convenience stores, and online shopping via mobile applications. Such behaviors were evident with the number of e-Money accounts⁶ that grew steadily every year. At the end of 2018, there were 77.6 million e-Money accounts, increased by 25.8 million accounts from the previous year, or equivalent to a growth of 49.9 percent. Of the total e-Money accounts, 77.3 percent were issued by non-bank providers. The dramatic increase in e-Money accounts partly came from the state welfare cards for the low-income earners issued under the national strategies. As of June 2019, the number of e-Money accounts grew continually to 79.7 million accounts, or up 2.1 million accounts from the end of 2018, following the increasing demands.

The volume and value of e-Money transactions, in 2018, exhibited a substantial growth rate in line with the growing number of e-Money accounts. The volume of e-Money usage stood at 1,510.4 million transactions, while the value of e-Money transactions totaled at 203.2 billion baht, increasing from 2017 by 18.9 percent and 63 percent, respectively. In particular, the transactions made through bank e-Money service providers increased to 37.7 million transactions from 3.3 million transactions in 2017 or increasing by 12 times. One contributing factor of such increases was cash withdrawals made via state welfare cards that allowed cardholders to withdraw cash under conditions specified by the Ministry of Finance.

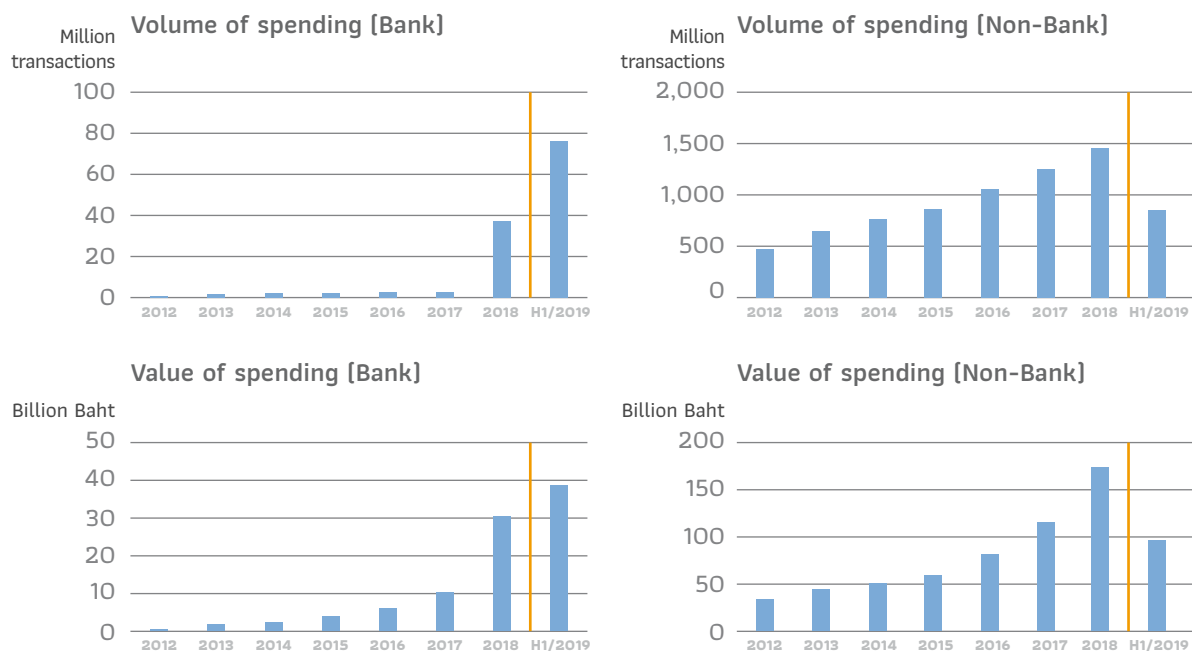
⁴ Number of cards or accounts and volume and value of spending included only e-Money characterized as cash replacement for paying for goods and services and excluded e-Money offered for mobile phone top-ups.

⁵ List of e-Money payment business providers from www.bot.or.th (Home > Payment system > Payment System Act B.E. 2560)

⁶ e-Money accounts include both card-based and network-based e-Money accounts.

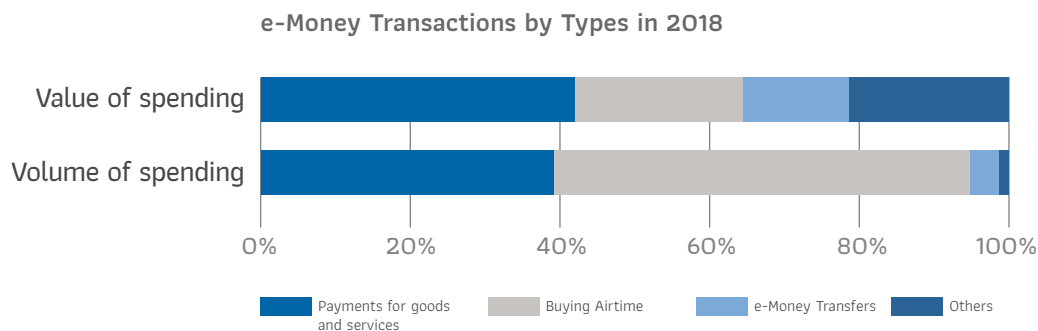


Figure 19: Volume and Value of e-Money



Source: Bank of Thailand

Figure 20: e-Money Transactions by Types in 2018



Source: Bank of Thailand

2018	Payments for goods and services	Buying Airtime	e-Money Transfers	Others
Value [Million Baht]	78,436.2	41,790.3	27,106.9	40,510.4
Volume [Million transactions]	569.2	806.9	57.5	22.7
Average Value [Baht per Transaction]	137.8	51.8	471.4	1,783.5

Source: Bank of Thailand



Overall, in 2018, e-Money services provided by both banks and non-banks still showed a noticeably upward trend though the usage was mainly for low-value payments. The average value of 137.8 baht per transaction suggested that e-Money services were mostly used for everyday expenditures. Meanwhile, the average value of transfers between e-Money accounts was much higher at 471.4 baht per transaction. Further, comparing the proportion of e-Money transactions by spending objectives indicated that e-Money was used mostly for mobile phone top-ups (buying airtime), followed by payments for goods and services, e-Money funds transfer and other spending⁷, respectively.

Payment Aboard

Payment aboard exhibited an upward trend in line with the increasing number of Thais traveling overseas. Payment abroad can be classified into 3 approaches, namely electronic card payments at the point of sale aboard, foreign currency exchanges, and cash withdrawals at ATM/CDM. In the past years, electronic card payment aboard has continually increased. This is partly because commercial banks increasingly promote the use of electronic cards aboard as well as introduce privileges and discounts. Meanwhile, foreign currency exchanges and cash withdrawals at automated machines abroad have declined, compared to total spending aboard.



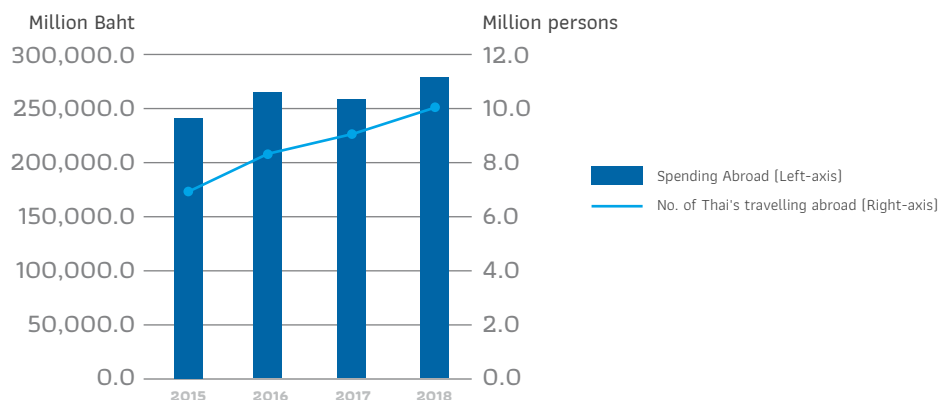
Using electronic cards at the point of sale aboard gained increasing popularity; still, credit cards remained preferable to debit cards.



⁷ Other spending such as cash redeemed from expired cards or others

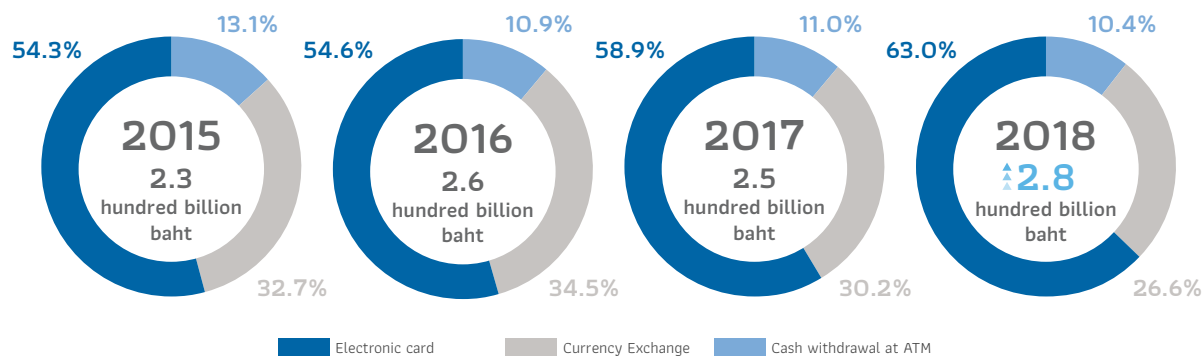


Figure 21: Payment abroad and number of Thai people travelling abroad



Source: Bank of Thailand

Figure 22: Payment Abroad by Approaches during 2015 - 2018



Source: Bank of Thailand

Categorized by different electronic card types, i.e., credit cards and debit cards revealed that credit cards remained preferable to debit cards for payment abroad and accounted for 78.8 percent of total electronic card transactions overseas. Nonetheless, more Thais turned to debit cards for payments for goods and services abroad owing to commercial banks' promotions encouraging customers to switch to debit cards when spending overseas. In 2018, the use of debit cards abroad rose 66.9 percent in terms of volume and 43.4 percent in terms of value.



Digital Payment is to be the most preferred choice



IV

Appendix





Glossary and abbreviation

ATM	Automated Teller Machine
BAHTNET	Bank of Thailand Automated High-Value Transfer Network
BIS	Bank for International Settlements
BOT	Bank of Thailand
CDM	Cash Deposit Machine
e-Commerce	Electronic Commerce
e-Money	Electronic Money
e-Payment	Electronic Payment
e-Wallet	Electronic Wallet
EDC	Electronic Data Capture
EFTPOS	Electronic Funds Transfer at Point Of Sale
ETC	Electronic Transactions Commission
FSAP	Financial Sector Assessment Program
ICAS	Imaged Cheque Clearing and Archive System
ISO	International Organization for Standardization
m-Commerce	Mobile Commerce
NITMX	National ITMX
Non-bank	Non-bank financial institution
ORFT	Online Retail Funds Transfer
PFMIs	Principles for Financial Market Infrastructures
PIRPS	Prominently Important Retail Payment Systems
PSC	Payment Systems Committee
QR code	Quick Response Code
SEC	The Securities and Exchange Commission, Thailand
SFIs	Specialized Financial Institutions
SIPS	Systemically Important Payment Systems
WC-PSS	Working Committee on Payment and Settlement Systems



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Table 1: Basic statistical data

	2013	2014	2015	2016	2017	2018
Population (millions)	64.79	65.12	65.73	65.93	66.19	66.41
GDP current price (billion Baht)	12,771.3	13,230.8	14,020.4	14,911.6	15,724.9	16,353.1
GDP per capita (Baht)	197,119	203,176	213,302	226,173	237,572	246,245
Exchange rate vis-à-vis US\$ (at year-end)	32.82	32.96	36.08	35.82	32.66	32.42

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

Table 2: Technological infrastructure¹

	2013	2014	2015	2016	2017	2018
Total fixed network telephone subscribers (millions)	6.04	5.69	5.31	4.71	3.47	2.93
Total mobile telephone subscribers (millions)²	92.94	97.09	102.94	118.35	121.53	125.10
Postpaid	11.28	12.85	17.78	22.74	26.53	29.40
Prepaid	81.66	84.24	85.16	95.61	95.00	95.70
Total Internet users (millions)	26.14	27.65	39.47	43.87	45.19	47.45
Penetration rates						
Fixed network telephone (%)	9.33	8.74	8.08	7.14	4.00	4.41
Mobile telephone (%)	143.45	149.08	156.61	179.50	183.61	188.36

Sources: Division of Telecommunication Economics Research and Information Center Telecommunication Policy and Resource Management Bureau Office of National Broadcasting and Telecommunications Commission (NBTC)

¹ Data source was changed since 2016 and all data was reviewed.

² Data as of November 2016

Table 3: Narrow money (at year-end , million Baht)

	2013	2014	2015	2016	2017	2018
Narrow money (1+2)	1,661,303	1,682,470	1,778,050	1,864,165	2,038,860	2,095,155
1. Currency outside Depository Corp.& Central Gov.	1,188,888	1,200,331	1,250,926	1,335,952	1,437,558	1,504,449
Banknotes in circulation	1,425,282	1,503,679	1,539,848	1,627,997	1,734,078	1,784,153
Coins in circulation	54,322	56,622	59,888	63,986	68,755	73,599
Less: currency held by Central Gov.	1,115	1,247	1,094	1,115	830	875
Less: currency held by Depository Corp.	289,601	358,723	347,716	354,916	364,445	352,428
Held by commercial banks	238,668	299,916	290,772	301,309	306,968	297,832
Held by finance companies	0	0	0	0	0	0
Held by Specialized Financial Institutions	50,538	58,385	56,544	53,211	57,240	54,341
Held by savings cooperatives	395	422	400	396	237	255
Held by money market mutual funds	0	0	0	0	0	0
2. Transferable deposits at Depository Corp.	472,415	482,139	527,124	528,213	601,302	590,706
Transferable deposits at Bank of Thailand	3,225	2,708	2,697	5,050	4,974	1,907
Transferable deposits at commercial banks	464,220	475,561	519,296	518,085	590,676	585,207
Transferable deposit at SFIs	4,970	3,870	5,131	5,078	5,652	3,592

Source: Bank of Thailand



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

	2013	2014	2015	2016	2017	2018
Currency outside Depository Corp. & Central Gov. ¹	1,189	1,200	1,251	1,336	1,438	1,407
Transferable deposits at Depository Corp.	472	482	527	528	601	586
Narrow money	1,661	1,682	1,778	1,864	2,039	1,993
Broad money ²	16,062	16,808	17,552	18,289	19,206	19,588

Source: Bank of Thailand

¹ Banknotes outside depository corporations and coins issued by central government.

² Narrow money and quasi money (other deposits at Depository Corp.+securities other than shares)

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

	2013	2014	2015	2016	2017	2018
Balances held at central bank	108.0	107.5	121.9	110.1	123.0	135.3
Stock of high-quality liquid assets ¹	-	-	-	3,585.6	3,627.0	3,860.8
Required reserves	677.9	713.8	749.0	-	-	-
Free reserves	2,416.9	2,354.4	2,445.5	-	-	-
Transferable deposits at other banks	4.8	5.3	3.5	4.1	5.2	4.5
Memorandum item:	122.7	108.1	88.2	69.5	33.9	3.4
Institutions borrowing from central bank						

Source: Bank of Thailand

¹ From 2016, depending on Bank of Thailand Notification No. FMOG 56/2558, Prescription on the Maintenance of Reserve Requirement by Commercial Banks, Commercial banks are required to maintain reserve assets on average over a fortnightly period, starting on a Wednesday and ending on a second Tuesday thereafter, equaled to 1 percent of the previous period's average level of commercial banks' deposits and short-term foreign liabilities base.



Table 6: Indicators of the use of various cashless payment instruments - Volume of transactions (in thousands)

	2013	2014	2015	2016	2017	2018
Paper-based:	118,365	118,791	120,455	118,754	113,783	109,964
In-house cheque ¹	44,793	46,103	49,418	49,309	48,001	46,684
Interbank cheque	73,572	72,687	71,037	69,446	65,782	63,280
Electronic payment cards:	3,182,137	3,370,883	3,636,343	3,978,784	4,326,023	4,671,481
ATM card	535,350	502,026	487,986	411,513	301,822	237,597
for cash withdrawal via ATM	415,872	395,880	377,369	318,681	239,280	200,285
for other purposes ²	119,478	106,146	110,617	92,832	62,542	37,312
Debit card ³	1,576,484	1,655,143	1,808,115	1,990,901	2,208,653	2,323,384
for cash withdrawal via ATM	1,165,118	1,206,078	1,332,160	1,489,565	1,676,475	1,831,972
for purchasing purpose via EFTPOS	37,221	43,375	51,347	65,956	83,865	110,244
for other purposes ⁴	374,144	405,690	424,608	435,380	448,314	381,168
Credit card ⁵	401,093	425,781	456,889	500,072	542,579	599,664
for purchasing purpose	373,046	397,697	421,448	465,730	510,763	565,803
for other purposes ⁶	28,047	28,083	35,442	34,343	31,816	33,861
e-Money ⁷	669,210	787,932	883,352	1,076,298	1,272,968	1,510,836
Automated:	346,410	349,034	369,644	392,645	415,546	460,813
Direct credit ⁸	214,657	211,479	224,222	234,202	244,733	276,667
Direct debit ⁹	93,636	96,205	100,568	107,630	114,944	123,636
ITMX Bulk Payment	34,864	37,944	41,231	46,801	51,646	56,054
BAHTNET ¹⁰	3,253	3,406	3,623	4,013	4,224	4,456

Source: Bank of Thailand

¹ Some banks do not report in-house provincial cheques and inter-provincial cheques.

² Data include purchasing goods and services, deposit and funds transfer.

³ Domestic and overseas spending of Thai debit cards.

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

⁵ Domestic and overseas spending of Thai credit cards and domestic spending of foreign credit cards.

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

⁷ Data exclude top-up cards.

⁸ Intra-bank pre-authorized direct credit.

⁹ Intra-bank pre-authorized direct debit.

¹⁰ Data include funds transfer, third party funds transfer and Multilateral Funds Transfer.



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

	2013	2014	2015	2016	2017	2018
Paper-based:	64,581	61,595	61,583	60,895	59,530	56,812
In-house cheque ¹	24,262	23,632	24,142	23,762	23,651	21,780
Interbank cheque	40,319	37,963	37,441	37,133	35,879	35,031
Electronic payment cards:	14,498	14,922	15,279	15,221	15,044	14,348
ATM card	2,451	2,419	2,352	1,951	1,476	1,168
for cash withdrawal via ATM	1,846	1,761	1,664	1,403	1,076	888
for other purposes ²	606	658	688	548	400	280
Debit card ³	10,475	10,820	11,136	11,354	11,530	10,960
for cash withdrawal via ATM	5,743	5,905	6,320	6,778	7,301	7,369
for purchasing purpose via EFTPOS	100	106	111	135	154	182
for other purposes ⁴	4,633	4,810	4,705	4,441	4,076	3,409
Credit card ⁵	1,524	1,626	1,722	1,825	1,912	2,010
for purchasing purpose	1,282	1,384	1,465	1,574	1,672	1,758
for other purposes ⁶	241	242	257	251	240	252
e-Money ⁷	48.0	56.2	67.6	91.0	126.0	209.0
Automated:	699,527	778,999	814,821	901,257	918,687	882,366
Direct credit ⁸	13,500	14,065	15,199	16,623	18,000	19,827
Direct debit ⁹	4,117	4,467	6,250	7,588	7,567	7,727
ITMX Bulk Payment	2,187	2,469	2,538	2,941	3,060	3,436
BAHTNET ¹⁰	679,723	757,998	790,834	874,106	890,060	851,375

Source: Bank of Thailand

¹ Some banks do not report in-house provincial cheques and inter-provincial cheques.

² Data include purchasing goods and services, deposit and funds transfer.

³ Domestic and overseas spending of Thai debit cards.

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

⁵ Domestic and overseas spending of Thai credit cards and domestic spending of foreign credit cards.

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

⁷ Data exclude top-up cards.

⁸ Intra-bank pre-authorized direct credit.

⁹ Intra-bank pre-authorized direct debit.

¹⁰ Data include funds transfer, third party funds transfer and Multilateral Funds Transfer.



Table 8: Use of credit cards and debit cards via EFTPOS (monthly average per card, Baht)

	2013	2014	2015	2016	2017	2018
Credit card ¹	4,815	4,814	4,673	4,988	5,081	4,955
Debit card ²	167	182	182	196	224	241

Source: Bank of Thailand

¹ Domestic and overseas spending of Thai credit cards via EFTPOS and domestic spending of foreign credit cards.

² Domestic and overseas spending of Thai debit cards via EFTPOS.

Table 9: Cash withdrawal via ATM (monthly average per card, Baht)

	2013	2014	2015	2016	2017	2018
ATM card	7,156	6,755	6,501	5,658	4,764	4,154
Debit card ¹	11,146	11,238	11,264	10,885	10,679	9,798

Source: Bank of Thailand

¹ Domestic and overseas cash withdrawal of Thai debit cards via ATM.

Table 10: Notes and coins (at year-end, million Baht)

	2013	2014	2015	2016	2017	2018
Notes and coins	1,479,604	1,560,301	1,719,372	1,773,469	1,878,237	1,933,082
Notes:	1,425,282	1,503,679	1,659,484	1,709,483	1,809,482	1,859,483
500,000 Baht	118	118	134	152	157	160
1,000 Baht	1,202,441	1,282,400	1,318,903	1,317,006	1,402,484	1,460,469
500 Baht	138,695	124,976	140,933	173,682	184,638	164,088
100 Baht	129,095	141,047	140,768	155,103	152,363	159,570
80 Baht	150	151	152	152	152	152
70 Baht	0	0	0	1,393	1,393	1,393
60 Baht	1,178	1,181	1,187	1,247	1,247	1,247
50 Baht	13,347	19,070	18,379	19,208	22,941	25,728
20 Baht	30,801	36,884	35,372	37,885	40,453	43,022
10 Baht	3,334	3,332	3,330	3,329	3,328	3,328
5 Baht	196	196	196	196	196	196
1 Baht	121	121	121	121	121	121
50 Satang	9	9	9	9	9	9
Coins:	54,322	56,622	59,888	63,986	68,755	73,599

Source: Bank of Thailand



Table 11: Institutional infrastructure

	2013	2014	2015	2016	2017	2018
Central Bank						
Number of Institutions	1	1	1	1	1	1
Number of Branches	3	3	3	3	3	3
Number of Accounts ¹	193	194	193	186	184	184
Value of Accounts (million Baht) ¹	439,205	310,154	533,275	265,970	352,586	546,015
Thai Commercial Banks						
Number of Institutions	16	17	19	19	19	21
Number of Branches	6,696	6,986	7,040	6,998	6,766	6,717
Number of Accounts	84,433,032	86,582,576	88,529,904	90,648,406	94,846,533	99,882,718
Value of Accounts (million Baht)	10,350,543	11,065,024	11,347,475	12,433,454	13,062,173	13,591,551
Specialized Financial Institutions						
Number of Institutions	6	6	6	6	6	6
Number of Branches	2,549	2,445	2,445	2,468	2,471	2,475
Number of Accounts	54,377,970	59,539,994	63,243,722	68,569,387	74,242,903	72,594,911
Value of Accounts (million Baht)	3,604,591	3,901,266	4,214,675	4,450,107	4,686,137	4,940,815
Foreign Bank Branches						
Number of Institutions	14	14	12	11	11	11
Number of Branches	19	19	19	18	18	18
Number of Accounts	89,617	79,641	72,132	68,580	68,819	71,202
Value of Accounts (million Baht)	700,469	789,461	798,701	908,302	814,701	812,854

Sources: Bank of Thailand

¹ Data exclude regional office.

Table 12: Payment instructions handled by selected interbank settlement systems Volume of transactions (in thousands)

	2013	2014	2015	2016	2017	2018
Paper-based:	73,572	72,687	71,036	69,446	65,782	63,280
Intra-provincial Cheque in Bangkok and vicinity ¹	52,051	50,215	48,701	47,322	44,664	42,663
Intra-provincial Cheque in Regional Area ²	13,312	11,455	11,053	10,775	10,421	10,212
Inter-provincial Cheque ³	8,209	11,017	11,283	11,350	10,698	10,404
Automated:	170,153	184,270	192,769	192,450	178,878	152,675
BAHTNET ⁴	3,253	3,406	3,623	4,013	4,224	4,456
ITMX Bulk Payment	34,864	37,944	41,231	46,789	51,646	56,054
ORFT-ATM	132,035	142,920	147,916	141,648	123,009	92,165

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

¹ ICAS was implemented to replaced ECS on 4 February 2012.

² Provincial Cheque Clearing migrated to ICAS since 15 November 2012 and implemented nationwide in December 2013.

³ Inter-provincial Cheques cleared via ICAS since 16 May 2013.

⁴ Data include funds transfer, third party funds transfer and Multilateral Funds Transfer.



Table 13: Payment instructions handled by selected interbank settlement systems Value of transactions (billion Baht)

	2013	2014	2015	2016	2017	2018
Paper-based:	40,319	37,963	37,440	37,133	35,879	35,031
Intra-provincial Cheque in Bangkok and vicinity ¹	35,980	33,530	33,063	32,852	31,642	30,796
Intra-provincial Cheque in Regional Area ²	3,684	3,500	3,368	3,245	3,189	3,189
Inter-provincial Cheque ³	655	933	1,008	1,036	1,048	1,046
Automated:	682,762	761,411	794,347	877,955	893,909	855,420
BAHTNET ⁴	679,723	757,998	790,834	874,106	890,060	851,375
ITMX Bulk Payment	2,187	2,469	2,538	2,939	3,060	3,436
ORFT-ATM (Online Retail Funds Transfer)	852	944	975	910	789	609

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

¹ ICAS was implemented to replaced ECS on 4 February 2012.

² Provincial Cheque Clearing migrated to ICAS since 15 November 2012 and implemented nationwide in December 2013.

³ Inter-provincial Cheques cleared via ICAS since 16 May 2013.

⁴ Data include funds transfer, third party funds transfer and Multilateral Funds Transfer.

Table 14: Securities transfer instructions handled by securities settlement systems - Volume of transactions

	2013	2014	2015	2016	2017	2018
Bond registry system:						
Government securities	4,222	2,009	1,372	511	414	429
Book-entry system:						
Equity securities (in millions)	3.72	4.09	4.72	5.47	5.95	6.10
Government securities (in millions)	0.19	0.20	0.20	0.21	0.23	0.24

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

Table 15: Securities transfer instructions handled by securities settlement systems Value of transactions (billion Baht)

	2013	2014	2015	2016	2017	2018
Bond registry system:						
Government securities	50.00	22.75	49.52	94.44	82.65	62.83
Book-entry system:						
Equity securities	1,220.00	1,027.83	1,081.33	1,209.11	1,055.41	1,406.66
Government securities	81,839.00	87,274.82	86,804.54	116,869.57	124,323.13	125,642.17

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



Table 16: Number of participants in selected payment and settlement systems

	2013	2014	2015	2016	2017	2018
BAHTNET ¹	64	64	65	66	64	67
Intra-provincial Cheque in Bangkok and vicinity ²	36	36	37	38	36	36
Intra-provincial Cheque in Regional Area ³	23	36	23	23	23	22
Inter-provincial Cheque ⁴	36	36	37	35	36	36
ITMX Bulk Payment	31	30	33	32	33	32
Bond registry system:						
Government securities	211,631	113,842	460,436	461,723	462,309	579,429
Book-entry system:						
Equity securities and Government securities	86	38	39	39	39	39

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

¹ Data include funds transfer, third party funds transfer and Multilateral Funds Transfer.

² ICAS was implemented to replaced ECS on 4 February 2012.

³ Provincial Cheque Clearing migrated to ICAS since 15 November 2012 and implemented nationwide in December 2013.

⁴ Inter-provincial Cheques cleared via ICAS since 16 May 2013.

Table 17: Number of Automated machines¹ and EFTPOS terminals²

	2013	2014	2015	2016	2017	2018
Total of Automated machines	56,851	61,614	63,432	64,115	66,944	65,976
Bangkok	16,304	16,727	16,790	16,658	17,243	16,447
Central	19,640	21,288	21,894	22,125	23,465	23,578
Northeast	7,270	9,255	9,699	7,926	10,160	10,038
North	6,110	6,853	7,142	8,588	7,562	7,489
South	7,527	7,491	7,907	8,818	8,514	8,424
Total of EFTPOS terminals	290,246	361,871	411,755	470,835	708,976	870,199
Bangkok	135,108	172,485	173,693	194,002	260,677	338,749
Central	71,665	86,671	110,407	127,983	203,030	252,384
Northeast	22,770	28,131	36,056	42,102	78,439	90,311
North	28,565	34,339	41,428	47,571	81,204	92,369
South	32,138	40,245	50,171	59,177	85,626	96,386

Source: Bank of Thailand

¹ Automated Teller Machines (ATM) and Cash Deposit Machines (CDM)

² Data include commercial banks and some credit card companies.

Table 18: Number of electronic payment cards

	2013	2014	2015	2016	2017	2018
Total	87,970,298	93,491,615	91,131,751	94,020,965	97,984,264	101,532,986
Credit card ¹	18,626,864	20,303,751	18,974,393	20,230,257	20,571,634	22,074,802
ATM card	24,101,957	25,066,799	21,743,686	19,638,033	18,380,892	17,390,984
Debit card	45,241,477	48,121,065	50,413,672	54,152,675	59,031,738	62,067,200

Source: Bank of Thailand

¹ Data include non-bank.



Table 19: Sources of payment revenues of Thai commercial banks (million Baht)¹

	2013	2014	2015	2016	2017	2018
Total	71,680	76,257	81,715	87,648	92,197	92,918
Credit card	27,419	29,501	31,347	33,210	34,009	36,364
ATM/Debit card and e-banking	25,194	26,851	29,275	31,575	33,350	33,354
Money transfer and collection	16,944	17,896	19,178	21,051	23,227	21,682
Cheque-related fee	2,123	2,009	1,915	1,812	1,611	1,518

Source: Bank of Thailand

¹From 2013, data exclude securities custodian and letter of credit

Table 20: Sources of payment revenues of foreign bank branches (million Baht)¹

	2013	2014	2015	2016	2017	2018
Total	4,428	4,323	3,964	4,153	4,289	4,573
Credit card	3,011	2,844	2,758	2,903	2,935	3,291
ATM/Debit card and e-banking	50	48	41	42	45	44
Money transfer and collection	1,234	1,310	1,063	1,109	1,216	1,154
Cheque-related fee	133	121	102	99	93	84

Source: Bank of Thailand

¹From 2013, data exclude securities custodian and letter of credit

Table 21: Daily averages of BOT payment services - Volume of transactions

	2013	2014	2015	2016	2017	2018
BAHTNET ¹	13,278	13,901	14,909	16,446	17,310	18,188
Intra-provincial Cheque in Bangkok and vicinity ²	212,453	204,961	200,415	193,941	183,047	174,136
Intra-provincial Cheque in Regional Area ³	54,336	46,756	45,484	44,160	42,708	41,682
Inter-provincial Cheque ⁴	33,505	44,966	46,431	46,516	43,845	42,467
ITMX Bulk Payment	142,304	154,874	169,674	191,758	211,663	228,792

Source: Bank of Thailand

¹ Data include funds transfer, third party funds transfer and Multilateral Funds Transfer.

² ICAS was implemented to replaced ECS on 4 February 2012.

³ Provincial Cheque Clearing migrated to ICAS since 15 November 2012 and implemented nationwide in December 2013.

⁴ Inter-provincial Cheques cleared via ICAS since 16 May 2013.

Table 22: Daily averages of BOT payment services - Value of transactions (billion Baht)

	2013	2014	2015	2016	2017	2018
BAHTNET ¹	2,774	3,094	3,254	3,582	3,648	3,475
Intra-provincial Cheque in Bangkok and vicinity ²	147	137	136	135	130	126
Intra-provincial Cheque in Regional Area ³	15.0	14.3	13.9	13.3	13.1	13.0
Inter-provincial Cheque ⁴	2.7	3.8	4.1	4.2	4.3	4.3
ITMX Bulk Payment	8.9	10.1	10.4	12.0	12.5	14.0

Source: Bank of Thailand

¹ Data include funds transfer, third party funds transfer and Multilateral Funds Transfer.

² ICAS was implemented to replaced ECS on 4 February 2012.

³ Provincial Cheque Clearing migrated to ICAS since 15 November 2012 and implemented nationwide in December 2013.

⁴ Inter-provincial Cheques cleared via ICAS since 16 May 2013.



Table 23: Peak day figures of BOT payment services - Volume of transactions

	2013	2014	2015	2016	2017	2018
BAHTNET ¹	22,190	21,820	29,033	28,827	28,077	36,044
Intra-provincial Cheque in Bangkok and vicinity ²	547,406	417,618	484,821	445,684	429,714	386,101
Intra-provincial Cheque in Regional Area ³	114,492	90,005	97,533	83,358	79,595	83,420
Inter-provincial Cheque ⁴	172,463	184,197	188,315	190,831	186,206	187,085
ITMX Bulk Payment	508,748	473,040	574,555	615,266	744,926	790,750

Source: Bank of Thailand

¹ Data include funds transfer, third party funds transfer and Multilateral Funds Transfer.

² ICAS was implemented to replaced ECS on 4 February 2012.

³ Provincial Cheque Clearing migrated to ICAS since 15 November 2012 and implemented nationwide in December 2013.

⁴ Inter-provincial Cheques cleared via ICAS since 16 May 2013.

Table 24: Peak day figures of BOT payment services - Value of transactions (billion Baht)

	2013	2014	2015	2016	2017	2018
BAHTNET ¹	8,384.9	3,877.3	4,776.2	4,610.3	4,845.0	4,684.5
Intra-provincial Cheque in Bangkok and vicinity ²	283.4	266.0	297.5	248.6	212.6	248.9
Intra-provincial Cheque in Regional Area ³	26.8	25.6	25.1	22.4	22.3	22.2
Inter-provincial Cheque ⁴	11.0	12.4	12.6	13.7	13.4	15.8
ITMX Bulk Payment	44.3	77.8	46.4	83.1	47.7	63.4

Source: Bank of Thailand

¹ Data include funds transfer, third party funds transfer and Multilateral Funds Transfer.

² ICAS was implemented to replaced ECS on 4 February 2012.

³ Provincial Cheque Clearing migrated to ICAS since 15 November 2012 and implemented nationwide in December 2013.

⁴ Inter-provincial Cheques cleared via ICAS since 16 May 2013.

Table 25: Use of mobile banking

	2013	2014	2015	2016	2017	2018
No. of agreements	1,164,796	6,229,960	13,918,815	20,883,147	31,779,042	45,378,356
Volume of transactions	57,198,604	109,349,726	263,922,502	584,983,180	1,228,270,303	2,727,906,573
Value of transactions (million Baht)	751,558	1,364,022	2,800,299	5,360,605	8,997,136	16,827,632

Source: Bank of Thailand

Table 26: Use of internet banking

	2013	2014	2015	2016	2017	2018
No. of agreements	8,033,061	10,159,971	11,901,117	15,095,696	19,899,583	23,098,101
Volume of transactions ¹	161,784,249	188,408,939	186,236,816	240,461,111	248,478,233	418,783,675
Value of transactions (billion Baht)	19,548.0	20,500.4	23,629.7	29,706.3	23,513.0	27,177.4

Source: Bank of Thailand

¹ Enquiry transactions were excluded.



Table 27: Use of ORFT (Online Retail Funds Transfer) - Volume of transactions (in thousands)

	2013	2014	2015	2016	2017	2018
Total	173,909	199,633	235,636	298,975	463,248	1,177,194
ATM	132,035	142,920	147,916	141,648	123,009	92,165
Counter	9,160	9,146	9,791	9,702	8,781	6,802
Internet banking	32,714	47,567	77,928	147,624	331,458	1,078,227

Source: Bank of Thailand

Table 28: Use of ORFT (Online Retail Funds Transfer) - Value of transactions (billion Baht)

	2013	2014	2015	2016	2017	2018
Total	1,399	1,588	1,819	2,184	3,042	6,870
ATM	852	944	975	910	789	609
Counter	201	191	189	183	171	145
Internet banking	347	453	656	1,091	2,082	6,116

Source: Bank of Thailand

Table 29: Bill payment at counters - Volume of transactions (in thousands)

	2013	2014	2015	2016	2017	2018
Total	359,423	397,260	429,287	479,106	510,820	361,121
Total bill payment at bank counters	87,992	101,736	107,262	113,367	120,891	85,729
Cash	84,297	97,018	101,594	104,354	107,590	71,514
Cheque	1,560	1,911	2,321	3,007	3,624	2,803
Others	2,135	2,807	3,348	6,006	9,677	11,412
Total bill payment at non-bank counters	271,431	295,524	322,025	365,739	389,929	275,392
Cash	266,825	291,486	318,340	362,038	385,640	272,998
Cheque	346	333	361	358	362	283
Others	4,260	3,705	3,324	3,342	3,927	2,111

Source: Bank of Thailand

Table 30: Bill payment at counters - Value of transactions (billion Baht)

	2013	2014	2015	2016	2017	2018
Total	5,985	7,048	7,704	7,461	7,906	5,555
Total bill payment at bank counters	5,278	6,272	6,886	6,608	7,010	4,902
Cash	1,933	2,431	2,696	2,802	3,077	2,299
Cheque	2,506	2,361	2,629	2,705	2,970	1,914
Others	838	1,481	1,561	1,102	963	689
Total bill payment at non-bank counters	708	776	818	853	896	652
Cash	700	768	810	845	887	646
Cheque	3	3	3	4	4	3
Others	5	5	4	4	5	3

Source: Bank of Thailand



Table 31: Use of e-Money¹

	2013	2014	2015	2016	2017	2018
No. of cards/accounts	24,286,746	26,852,975	31,070,380	39,181,287	53,171,877	77,574,058
Volume of transactions	669,210,802	787,932,371	883,352,315	1,076,300,313	1,272,235,125	1,511,010,671
Value of transactions (million Baht)	48,031.9	55,801.7	67,616.6	90,945.7	126,171.9	204,038.4

Source: Bank of Thailand

¹ Data exclude top-up cards.

Table 32: Fraud through specific payment channels and payment instruments¹ (million Baht)

	2013	2014	2015	2016	2017	2018
Total fraud	204	426	2,321	593	753	896
Payment channels ²	79	91	2,018	224	377	519
Payment instruments ³	125	335	303	369	376	377.0

Source: Bank of Thailand

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

² Fraud through specific payment channels include phone banking, mobile banking, internet banking, pass book and other channels.

³ Fraud via specific payment instruments include cheque, credit card, ATM card, debit card, prepaid card and other cards.



Notes of statistical tables

Symbols used in tables	Explanation
“_”	No data
“nav.”	Data not available
“neg.”	Negligible in value compared to all other
“0”	Zero or near zero in value

- Table 1
- Gross Domestic Product expressed in current price
 - Using the average foreign exchange rate
- Table 6-7
- Data on cheque includes both in-house and interbank cheques and is compiled from all commercial banks as well as Specialized Financial Institutions
 - Data on volume of credit card transactions includes bank cards, affinity cards, non-bank cards/affinity cards, and foreign credit cards used in Thailand
 - Data on credit card spending includes information on non-bank credit cards
 - Data on e-Money excludes pre-paid card for mobile phones
 - Direct credit refers to pre-authorized in-house direct credit funds transfers
 - Direct debit refers to pre-authorized in-house direct debit funds transfers
 - BAHTNET data consists of data relating to interbank funds transfers, third party funds transfers and multilateral funds transfers
- Table 8
- Average value of monthly transactions by debit cards and credit cards via EFTPOS terminals within and outside the country
- Table 11
- Excludes data on the number of accounts and outstanding amounts held by Bank of Thailand's regional offices



Table 12-13	- BAHTNET data includes data relating to interbank funds transfers, third-party funds transfer and multilateral funds transfer
Table 14-15	- Equity securities settlements are processed via scripless book-entry system only
Table 17	- Include ATMs and CDMs
	- Data on the number of EFTPOS terminals represents information consolidated from commercial banks and some credit card companies
Table 18	- Data on the number of credit cards includes non-bank credit cards
Table 21-24	- BAHTNET data includes data relating to interbank funds transfers, third-party funds transfer and multilateral funds transfer
Table 26	- Excluding enquiry transactions
Table 31	- Electronic money data does not include data on top up of mobile cards





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