The Oversight of Payment Systems1/

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Abstract

In Thailand, average daily values of payments have reached as high as Baht 250 billion, accounting for 5 percent of Gross Domestic Product. Thus, apart from their macro objective of price stability, central banks have increased their interest in maintaining financial stability as a micro objective, particularly in the core areas of the payment system. This paper aims to increase the understanding of this role in three ways. First, a conceptual framework is developed to group payment schemes into three levels and major payment systems are identified. Second, the central bank’s oversight of payment systems and their compliance with the BIS Core Principles are reviewed. And third, future challenges, particularly on the regulatory, technological and international fronts, are discussed.

1. Introduction

Payment systems are a major part of a country’s economic and financial infrastructure. They contribute towards promoting economic activity and improving macroeconomic management, including the release of funds from the clearing and settlement functions for more productive use, the reduction of float levels, the lowering of transactions costs, and the control of monetary aggregates.

While an efficient payment system facilitates the flow of funds, potential risks may also arise when payment failures occur, ranging from liquidity shortages to credit problems among participants. Moreover, such risks may develop into systemic risk that are transmitted from one member to another in the system, disrupting the smooth functioning of the payment system and the stability of the financial system.

In addition to their macro objective of price stability, central banks have a micro objective of maintaining financial stability, particularly in the core areas of the payment system and the commercial banks that operate it (Capie et al., 1994, pp. 91-92). In financial stability, central banks have an important responsibility in minimising systemic risks in payment systems, as the public has entrusted them with this duty (Padoa-Schioppa, 1992). Such responsibilities are also noted in the Core Principles for Systemically Important Payment Systems set out by the Bank for International Settlements, which emphasizes their disclosure of objectives, role and major policies, compliance of central bank systems, oversight of non-central bank systems and cooperation with other authorities (Bank for International Settlements, 2001).

In Thailand, the central bank plays three major roles in the payment system -

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service provider, regulator, and facilitator. The objective of this paper is to highlight the importance of its oversight work to ensure the safety and stability of the country’s payment system. The paper is organized as follows. Section 2 provides an overview of the payment system, introduces the payment pyramid and identifies the major payment systems. Section 3 discusses the Core Principles and provides a preliminary assessment of central bank payment services in Thailand. Section 4 concludes the paper by considering some emerging challenges for the oversight of payment systems.

2. Conceptual Framework

In Thailand, payment means may be grouped into two major categories- cash and non-cash payments. Cash consists of notes and coins, and is by far the most popular payment means, accounting for an average 73 percent of the currency ratio held by the public to the money supply.\(^2\) Non-cash payments include paper-based and paperless payments, including payment orders, cheques, bill of exchanges and promissory notes for the former, and electronic funds transfers through direct debit, direct credit, automated teller machines, or other electronic means, for the latter (Bank of Thailand, 1999c).

Payments may also be distinguished as payment schemes. By definition, a payment scheme establishes the framework in which payments are made, sets up the necessary rules, and develops and operates shared infrastructure such as telecommunication networks and brands (Cruickshank, 2000, p. 62). A payment scheme is considered self-sufficient if there is no requirement of further payments to be made through other payment schemes to complete a transaction, and settlement must be made using assets that are accepted as money. Figure 1 illustrates the payment pyramid, which groups payment schemes into three levels based on the type of service provider.

![Figure 1: The Payment Pyramid](image_url)

\(\text{Figure 1: The Payment Pyramid}\)

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\(^2\) Money supply (M1) is measured by cash and current account deposits held at commercial banks. Cash composition is based on figures between 1993-97 (International Monetary Fund, 1999).
**Level 1** consists of central bank payment schemes. These schemes form the national payments infrastructure, as they serve as the backbone for transferring payment transactions among financial institutions. The Bank of Thailand owns and operates the following payment systems: (1) BAHTNET (Bank of Thailand Automated High-value Transfer Network) is a payment system supporting the transfer of large value payments; (2) ECS (Electronic Cheque Clearing System) is a payment system supporting inter-bank cheque payments; (3) Provincial Cheque Clearing system at the provincial and district levels; and (4) Media Clearing is a payment system supporting the transfer of small value payments. In addition to these inter-bank settlement infrastructure payment schemes, the Bank of Thailand sets the rules and regulations for member institutions to follow, and oversees their smooth operations on a day to day basis.³/

**Level 2** of the payment pyramid consists of commercial bank payment schemes. This covers a range of payment products and services, including over the counter form-based instruments, card-based products, and new financial delivery channels such as Automated Teller Machines (ATMs), Internet banking, telephone banking and Financial Electronic Data Interchange (EDI). Thai commercial banks and foreign bank branches providing such services are under the direct supervision of the Bank of Thailand and would need to operate according to the Commercial Banking Act of 1962. While paper-based payments such as cheques, bills of exchange, and promissory notes are backed by the Civil and Commercial Code, funds transfer through electronic means follow guidelines and conditions of use set up by commercial banks, due to the lack of a legislation on electronic funds transfer.

**Level 3** of the payment pyramid consists of alternative payment schemes. Schemes under this group consist of services provided by non-banks and non-financial institutions whose operations are not supervised by the Bank of Thailand. Such schemes include, for example, convenience shop counter payment services, Electronic Bill Presentment and Payment (EBPP) services, credit card services, postal payment services provided by the Communications Authority of Thailand, and electronic money schemes initiated by private companies. Abroad, there have been new payment innovations provided by private firms that use the Internet as the channel in transferring money. These have ranged from electronic payment services such as PayPal, aimed at the market for small-value person-to-person payments, to Earthport, which provide cross-border payments in sterling, dollars, deutsche marks and French francs (Economist, 2001). In the latter scheme, transaction fees may be low as 12 Baht (GBP 0.20) regardless of the size of the transaction.⁴/

Thus, in recent years, the international banking community has raised the importance of systemically important payment systems, which is determined by the value and nature of a particular payment. Basically, payments that have high individual or aggregate values, and that are used for the settlement of financial market transactions, such as foreign exchange and securities, and the settlement

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³/ See references for a complete list of regulations, guidelines and notifications related to payment systems.

⁴/ See www.earthport.com
of other payment systems, are considered systemically important. Above all, a systemically important payment system has the ability to transmit shocks to both domestic and international financial systems. Box 1 illustrates major payment systems in Thailand, measured by their average daily volumes and values.

By aggregate values, it is interesting to note that BAHTNET and ECS are clearly systemically important payment systems, accounting for 5 percent and 2 percent of gross domestic product, respectively. Furthermore, maximum individual values for BAHTNET and ECS during the same year can be as high as Baht 24 billion and Baht 5 billion, respectively. Comparatively, the other payment systems have lower average daily values, owing partly to their focus for small value payments, and in some systems, predetermined limits for payment transfers. Such is the case of credit limits for credit cards and a pre-determined limit of 500,000 Baht per transaction in Media Clearing.

Figures 2 and 3 illustrate the average daily volumes and values of central bank payment services during 1997-2000. While

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<th>Box 1 : Major Thai Payment Systems (Average Daily Volumes and Values, 2000)</th>
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<td><strong>Payment System</strong></td>
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<td>BAHTNET</td>
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<td>ECS</td>
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<td>Provincial Cheque Clearing</td>
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<td>Media Clearing</td>
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<td>ATM Pool</td>
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<td>Credit Card</td>
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Source : Bank of Thailand
Note : n.a. - not available; 1/ Figures are for January to June 2000

**BAHTNET** is Thailand’s main high-value payment system providing services such as inter-bank funds transfer and financial information exchanges between member institutions.

**ECS** is an electronic cheque clearing system providing inter-bank clearing services.

**Provincial Cheque Clearing** is a cheque clearing system at the provincial and district levels.

**Media Clearing** is an automated retail payment system providing periodical payment services such as for salary, utility and dividend payments.

**ATM Pool** is a common national network of automated teller machines provided by commercial banks.

**Credit Card** is a “pay later” method of payment. Visa, American Express, and Diners Club are the main providers of credit cards in Thailand.
the transaction volumes for paper-based payments far exceed electronic payment means, this was the opposite case for transaction values. This is largely due to a regulatory measure initiated in March 2000, which instructed commercial banks to use BAHTNET for payments related to inter-bank lending, foreign exchange transactions, government securities trading and non-resident Baht account transactions. This led to the migration of large-value cheques that were originally processed by the ECS to a risk-averse real-time gross settlement system.

3. Oversight of Payment Systems

Payment systems modernization in Thailand started in the early-1990s and mainly included the computerization of current cheque clearing arrangements, and the development of new electronic payment systems (Watanagase, 1994). Since then, regular assessments have taken place. This has included a mission from the Monetary and Exchange Affairs Department of the International Monetary Fund, which reviewed the status of the payment system development program, advised on the pricing and policy issues for large-value payment systems, and reviewed user needs (Johnson et al., 1996). Subsequently, an independent consulting mission appointed by the World Bank, made a wide range of recommendations covering strategic and operational issues (Allsopp and Whitmore, 1999). Thus, these early assessment exercises played an important factor in guiding development and their compliance to many key areas of the Core Principles, as illustrated in Box 2.

The Bank of Thailand, like other international central banks, has started to review the country’s payment systems based on the Core Principles. Australia, for example, has grouped the Core Principles into objective and subjective assessment criteria and has rated highly the compliance of the country’s payment systems (Reserve Bank of Australia, 2000, pp. 31-37). Similarly, the United Kingdom has published a policy paper outlining the central bank’s role and major policies with respect to payment systems (Bank of England, 2000).

As earlier noted, the Bank of Thailand payment services have complied with many key areas of the Core Principles. Legally, the
Box 2: The Core Principles and Central Bank Responsibilities

**Public Policy Objectives: Safety and Efficiency in Systemically Important Payment Systems**

**Core Principles for systemically important payment systems**

I. The system should have a well-founded legal basis under all relevant jurisdictions.

II. The system’s rules and procedures should enable participants to have a clear understanding of the system’s impact on each of the financial risks they incur through participation in it.

III. The system should have clearly defined procedures for the management of credit risks and liquidity risks, which specify the respective responsibilities of the system operator and the participants and which provide appropriate incentives to manage and contain those risks.

IV. The system should provide prompt final settlement on the day of value, preferably during the day and at a minimum at the end of the day.

V. A system in which multilateral netting takes place should, at a minimum, be capable of ensuring the timely completion of daily settlements in the event of an inability to settle by the participant with the largest single settlement obligation.

VI. Assets used for settlement should preferably be a claim on the central bank; where other assets are used, they should carry little or no credit risk and little or no liquidity risk.

VII. The system should ensure a high degree of security and operational reliability and should have contingency arrangements for timely completion of daily processing.

VIII. The system should provide a means of making payments, which is practical for its users and efficient for the economy.

IX. The system should have objective and publicly disclosed criteria for participation, which permit fair and open access.

X. The system’s governance arrangements should be effective, accountable and transparent.

*Systems should seek to exceed the minima included in these two Core Principles.*

**Responsibilities of the central bank in applying the Core Principles**

A. The central bank should define clearly its payment system objectives and should disclose publicly its role and major policies with respect to systemically important payment systems.

B. The central bank should ensure that the systems it operates comply with the Core Principles.

C. The central bank should oversee compliance with the Core Principles by systems it does not operate and it should have the ability to carry out this oversight.

D. The central bank, in promoting payment system safety and efficiency through the Core Principles, should cooperate with other central banks and with any other relevant domestic or foreign authorities.
Civil and Commercial Code protects paper-based payments, while the legal process to enact the Electronic Transactions Law for electronic payments is under progress. Regulations on each payment system and operating guidelines for electronic funds transfer are published for members, while regular consultations are made with member representatives.

For settlement, BAHTNET is real-time gross settlement and adopts a queuing mechanism and gridlock resolution. Other oversight tools include intraday liquidity facilities to remove credit and liquidity risks in the system, while government securities are used as collateral. Similarly, a loss sharing agreement is under development for ECS and Media Clearing, while a lender of last resort facility is provided only when deemed suitable and necessary, and on a case-by-case basis. Moreover, assets that are used for settlement are based on current accounts maintained with the central bank. In terms of security, all payment systems are encrypted, fault-tolerant, backed-up by warm and cold sites, use a message authentication code, and have contingency plans.

Although there may be compliance in many areas of the Core Principles, the Bank of Thailand continues to promote safe and efficient payment systems. This has included cooperation with international authorities like the International Monetary Fund, the World Bank, the Bank for International Settlements, the South East Asian Central Banks, and the Executives' Meeting of East Asia and Pacific Central Banks and Monetary Authorities. Other channels of cooperation in the past have included assistance from foreign central banks, particularly in the area of studying foreign exchange settlement risks exposures of commercial banks.

4. Emerging Challenges

As discussed in the previous section, the Core Principles have provided a useful guideline for central banks in developing safe and efficient payment systems. Nevertheless, rapid technological changes continue to reshape the international financial landscape, raising many issues for public policy (Claessens et al., 2000). Such changes have had a large impact on payment systems, particularly on three fronts.

On the regulatory front, there is the challenge of creating a proper regulatory framework for payment systems. While some countries such as Australia, Canada, and Norway have passed explicit legislation on payment systems, other country laws have been implicit and apply existing laws to govern payments. In each case, the objectives have focused on efficiency, stability and the protection of consumers. In some countries, such as the United Kingdom, a comprehensive review of payment systems has been carried out and has led to proposals for an explicit legislation on payment systems and the delegation of powers to an existing authority to deal with competitive issues.

In Thailand, laws pertaining to payments have remained implicit in legislations such as the Bank of Thailand Act of 1942, the Currency Act of 1958, the Commercial Banking Act of 1962, and the Civil and Commercial Code. Moreover, the Bank of Thailand sets rules, regulations, guidelines and notifications that relate to the provision of payment services. In more recent developments, the issue of supervising payments by product has also been included in new Bank of Thailand Act, which is undergoing the legislative process. Elsewhere, draft information technology laws
that are under consideration, and having an impact on electronic payment developments, include the Data Protection Law, Computer Related Crime Law, Electronic Transactions Law, Electronic Funds Transfer Law and Universal Access Law.

Challenges faced by the current regulatory framework include issues such as whether or not the scope of regulation cover payment services provided by non-bank and non-financial institutions, and the interpretation of new electronic money schemes under the Currency Act of 1958. As argued in section 1, the current scope of regulation covers payment schemes that are in Level 1 and 2, which are that of the central bank and commercial banks, respectively. Hence, Level 3 payment schemes should consider other current legislation. For example, the Postage Act of 1934 and the Ministry of Transport and Communication’s regulations cover payment services provided by the Communications Authority of Thailand. Thus, there is the challenge of identifying what existing regulation, or new regulation, should apply to the introduction of new payment products and services.

On the technological front, there are challenges concerned with outsourcing, the regulating of ‘public’ networks, and the development of common standards to support the interoperability of payment systems. For outsourcing, an increasing number of commercial banks have contracted out their payment operations, particularly in the processing of card and cheque payments. Outsourcing companies come in the form of software houses or so called Application Service Providers. Outsourcing strategies are partly aimed at scaling down large investment cost in information technology to save costs and to increase efficiency. As the role of outsourcing companies in processing payments increase, there has been a possible tendency for them to be active players in payment associations, which have traditionally been dominated by commercial banks. Such interest by non-banks is not uncommon, as illustrated by the acceptance of the Post Office in the Association of Payment Clearing Services in the United Kingdom.

Another challenge is whether or not to regulate commercial bank computer networks if some segments utilize ‘public’ networks as compared to proprietary networks. Such is the case of commercial banks using Virtual Private Networks (VPNs), which are secured communication networks, provided by Internet Service Providers, in order to transfer funds. A major rationale for using VPNs is the potential savings in telecommunications costs, as public networks are used instead of proprietary connections. However, security concerns also arise during the transmission of funds in the secured ‘tunnel’ of the public network.

The challenge of payment systems integration through commonly agreed standards to allow interoperability and to reduce duplicative investments would also be an issue. While commercial banks strive for the straight through processing of payments, there is a tradeoff between maintaining costly legacy computer systems and making long-term investments in new systems that are based on more open and common standards. Future payment schemes would need to consider developments in distributed network technology, real-time processing, open standards, and the acceptance of electronic banking interfaces by customers (Leinonen, 2000). Thus, there is a need for common standards in the use of account numbers, particularly between the choice of the Inter-
national Bank Account Number (IBAN), a standard that has gained support in Europe, and the Bank Identification Code (BIC), which is a standard used by the Society for Worldwide Interbank Financial Telecommunication (SWIFT), which is an international payment system widely used by commercial banks worldwide.

On the international front, there are cross-border issues in the linking of payment systems across different countries to reduce potential foreign exchange settlement risks. Examples of such payment schemes are the Continuous Link Settlement (CLS) and the Hong Kong dollar clearing systems which are aimed at linking large-value payment systems. Others include the linking of international small-value payment systems such as the Worldwide Automated Transaction Clearing House (WATCH). Although developed to address the problem of foreign exchange risk exposures, there is the challenge of managing and synchronizing liquidity arrangements in payment systems that are in different time zones. On hindsight, there is also the challenge of whether or not foreign exchange exposures should be reduced with a technological approach. Alternatively, there have been proposals to use more local currencies in order to reduce currency exposure and conserve foreign exchange for trading in the intra-ASEAN region through the establishment of Pure Clearing Houses in member countries (Vichyanond et al., 2000). Such a scenario would be more of a financial, rather than a technological, solution.

In sum, the above challenges will shape developments in the future. While payment systems undergo a period of transition, including the development of new product and services, central banks would need to continue pursuing the dual public policy objectives of achieving safety and efficiency in systemically important payment systems.
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