

Executive Summary

Payment systems in Thailand have undergone progressive technological development in the past decade, but have also remained highly paper-based, subsidized and inefficient. The use of cash is predominant, while cheques account for most of the non-cash payments. This study was initiated to devise a pricing scheme that will promote wider use of efficient and low-risk electronic payment systems at the expense of costly paper-based payment systems. The study focuses mainly on BOT-owned payment services. The key findings and recommendations are as follows:

Key Findings

- 1. Costs of paper-based payments are high.** The estimated cost of writing cheques is particularly high and exceeds current charges. Comparatively, the estimated costs of electronic payments, excluding BAHTNET, have been generally lower than paper-based payments.
- 2. Direct payment fees make up less than half of total variable cost.** In 1998, direct fees accounted for less than half of the total variable costs in the payments market, which was estimated at 1,055 million baht. While payment fees collected by the Bank of Thailand and commercial banks accounted for 7.2 per cent and 42.1 per cent of the cost recovery, respectively, the remaining variable costs were recovered using float income and interest spread (49.1 per cent) as well as through direct subsidization from the Bank of Thailand (1.6 percent).
- 3. There is cross-subsidization among payment services.** Not all payment systems under this study were subsidized, or equally subsidized. Cheques were the most heavily subsidized of the products provided by commercial banks, while direct debit, direct credit registered substantial profit. The Bank of Thailand, on the other hand, subsidized all payment services it provides except ECS.
- 4. Payment efficiency is not at par with international best practices.** With regards to resource allocation, payment efficiency has lagged behind major international developments. Lessons learned from a review of four countries—the United States, Norway, Australia, and the United Kingdom—suggest the following. First, regulatory regimes were put in place to support pricing policies. Second, transparent, explicit, and cost-based pricing in the banking industry was encouraged. And third, paper-based payments were generally charged higher than electronic payments to promote cost-saving methods of payments. These payment practices were largely absent in Thailand.
- 5. There is conflict over branch network access.** For Media Clearing and BAHTNET, sending banks use receiving banks' branch network without proper compensation.

Key Recommendations

- 1. Promote electronic payments through price cap regulations.** Price caps or ceilings are set on all regulated payment products; all fees must be equal to or less than these caps. The initial price caps are based on the marginal cost pricing principle, amended with practical considerations. This regulation scheme will encourage service providers to enhance efficiency through cost saving innovations. Over time, adjustments to the price caps are made to account for inflation and technological advances in the payments system. Overall price caps are to be reviewed and possibly reset over a pre-determined time period or the ‘regulatory lag’.
- 2. Significant reductions in electronic payment fees.** BAHTNET and Media Clearing fees are reduced, from 250 baht to 100 baht and from 10 baht to 8 baht, respectively. The proposed fees are still higher than the average variable costs, to make room for the sending and the receiving banks to negotiate access pricing, or the compensation for accessing the receiving bank’s branch network.
- 3. Free BOT electronic payment services to promote their wider use.** In the short-term, the Bank of Thailand will charge no fees on the BAHTNET and Media Clearing, which is according to the marginal cost pricing with excess capacities on labor input. The measure seeks to pass cost savings on to commercial banks and the end-users and promote wider use of electronic payments. The free charges may be reviewed after current excess capacities of the two systems are eliminated.
- 4. A marginal and limited increase in cheque price.** Cheque price is raised by one baht, from 5 to 6 baht per cheque, and is limited to only personal and corporate cheques processed through ECS. The recommended price is still much below the average variable cost (15.5 baht), and is recommended in recognition of the fact that close electronic substitutes to cheques are not yet available. The fee hike is necessary to induce migration out of cheques, with further but gradual price increases recommended along with the progress in the development of electronic substitutes to cheque.
- 5. Introduce BOT cheque charges.** A charge of 15 baht would be introduced for the currently free BOT cheques, to discourage the use of costly paper-based payment products. Nonetheless, no fee increases would be made to ECS and provincial funds transfer.
- 6. The recommended fee structure should be acceptable to most parties.** It is estimated that the entire banking industry would be financially improved by 65.3 million baht over the next one year, thus reducing the current subsidization. The end-user would benefit from less expensive electronic payments.
- 7. An incentive negotiation scheme is advised.** The negotiation of fee allocation between the sending and receiving banks for BAHTNET and Media Clearing is encouraged through an incentive negotiation scheme. The negotiations should be bilateral, be rewarded for success and penalized for failure within a time limit of one month.
- 8. Two alternative price caps structures are compared.** Two alternatives to the recommended structures are compared; both keep the cheque price to their current levels. The first alternative lets commercial banks bear the cost of lowering

electronic payment fees, and is not recommended since it further increases the overall subsidization. The second alternative has the BOT bear the cost by lowering the ECS fee by one baht, and is not recommended, for it increases subsidization, particularly on cheques.

- 9. Promote competition in the payments market.** Measures for enhancing competition in the payments market should be developed. Examples include price transparency; encouraging independent fee setting instead of the current practice of collective agreements among banks; removal of anti-competitive regulations that discourage any potential providers from entering the payments market; prevention of unfair access or pricing practices. A comprehensive study of competition in the Thai banking industry with the focus on payment systems may be desirable.
- 10. Other non-price recommendations are made.** Non-price factors are at least as important as, if not more than, price factors in the promotion of electronic payments. Appropriate laws and better system protection will alleviate skepticism and wariness among the end-users toward electronic payment services. Cheques must have electronic substitutes, or have its processing more electronically performed. Information technology must be continually applied to payment systems.

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As always, final responsibility, including errors or omissions, resides with the project team.

Chapter 1

Introduction

Introduction

1.1. This report is the final product of the project “Payment Systems Pricing and Usage”, initiated and sponsored by the Bank of Thailand (BOT), with consultancy from the Thailand Development Research Institute (TDRI) and the AT Kearney Pte. Ltd. The project commenced in the fourth quarter of 1999 and lasted for about 9 months.

1.2. The project was initiated out of the need for the BOT to develop a coherent pricing scheme for the payment services it provides to the payment market. In particular, the pricing of electronic payment services which have recently been put in place needs to be reviewed.

Objective of the Study

1.3. The objective of this study is:

- To devise a new pricing scheme that will promote wider use of efficient and low-risk electronic payment systems at the expense of costly paper-based or form-based payment systems.

1.4. For practical reasons, attention would need to be given to some other considerations when making recommendations. These considerations are as follows.

- Payment fees must better reflect costs incurred in providing the services.
- Where the fees do not cover the full cost, as it will be shown to often be the case, the burden of subsidizing the services should be distributed fairly among parties involved.
- The proposed fee structure should be acceptable to the service providers as well as the end-users.

Scope of the Study

1.5. The recommendations on pricing scheme are limited only to those payment services that directly involve the Bank of Thailand (BOT); that is, parts of the process to complete these payment services go through the BOT. For example, cheques payable to receivers within the Bangkok Metropolitan Area (BMA) must go through the Bank of Thailand’s sorting and settlement facility.

1.6. However, due to possible substitutability between payment systems, attempts are made to gather information on some services in which the Bank of Thailand has no

involvement. However, since the Bank of Thailand does not regulate prices for these payment products, no recommendations on pricing of these products are made in this study. This study thus discusses a total of ten payment products, as shown in Table 1.1.

Table 1.1: List of Payment Services included in the Study

Paper-Based	Electronic-Based
Cashiers Cheque	Direct Debit
Draft	Direct Credit
Personal Cheque	BAHTNET
Corporate Cheque	Media Clearing
Provincial Cheque	Account-Based Money Transfer

Study Tools and Methodology: General Description

1.7. The study relied on various tools to gather information on Thai payment systems. These include:

- A corporate end-user survey,
- A fee and cost survey of the commercial banks,
- An additional cost survey from the commercial banks,
- Reports on international experiences on cost figures and pricing strategy,
- Bank of Thailand's internal cost and revenue figures,
- Personal interviews with officials of commercial banks soliciting their comments on the current payment systems and suggestions for changes,
- Occasional workshops with representatives of commercial banks and end-users, and
- Expert opinions.

1.8. The detailed findings from these tools will be presented in the remaining chapters of this report in the appropriate context. Here, the nature of each tool or method is described.

1.9. The corporate end-user survey was conducted in 1999 to understand the extent of use of payment services, and the price and non-price factors that determine the choice of payment services in this user group. A random sample of 1000 companies of varying sizes was selected for the survey, with 45 percent located in Bangkok and its vicinity and 11 percent each in the five regions, viz., the North, the Northeast, The East, The Central and the South. A total of 180 responses were received from these 1000 companies, giving a response rate of 18 percent.

1.10. The fee survey and the first cost survey were conducted together, also in 1999, with 13 commercial banks as survey samples (Table 1.2). While the fee survey gave a fairly good quality data, the findings from the cost survey suffered from serious data inconsistency among banks, resulting in a high variation in average cost between banks. The inconsistency arises from the lack of reliable cost accounting, different

accounting principles, and different coverage of processes needed to complete each payment service.

1.11. In an attempt to improve cost data quality, the second cost survey was designed and distributed in March 2000. In this survey, the commercial banks were asked only to input cost figures into an agreed-upon ‘cost blueprint’ for each payment product. The cost blueprints describe major processes needed to complete each payment service. This is seen as one way to reduce variability arising from different and incompatible coverage of component processes implied in the responses to the first survey. Due to stronger requirements on cost calculation and time limitations, only 6-8 commercial banks, depending on payment products, were able to provide detailed cost data. The participants of each of these surveys are listed in Table 1.2.

Table 1.2: Commercial Banks Participating in the Fee and Cost Surveys

Participating Bank	Fee and the First Cost Survey	The Second Cost Survey
1. Bangkok Bank	X	X
2. Bank of Asia	X	X
3. Bank of Ayudhya	X	
4. Citibank	X	X
5. DBS Thai Danu Bank	X	
6. Hong Kong and Shanghai Bank	X	
7. Krung Thai Bank	X	X
8. Sakura Bank	X	X
9. Siam City Bank	X	X
10. Siam Commercial Bank	X	
11. Standard Chartered Bank	X	
12. Thai Farmers Bank	X	X
13. Thai Military Bank	X	X

1.12. A consistency check was undertaken on the cost data from the second survey. This was done by comparing, process by process, cost figures from the responding banks. Unusually high or low cost figures were adjusted to make them more comparable with those from the other banks for the same processes. This resulted in a significant reduction of overall cost figures from the raw data.

1.13. The adjusted cost information was then compared to reports from international studies (Norway and United Kingdom), which were also adjusted for wage and other input price differences between Thailand and the countries in question. It is these final, adjusted cost figures from the second cost survey that serve as the *starting* figures for price recommendations in this study.

1.14. The international figures on relative price structure between electronic and paper-based payment products also serve as a benchmark price structure toward which price structure in Thailand should be gradually geared.

1.15. Two sets of cost figures have different sources. They are the cost figures for intra-provincial and inter-provincial cheques. The former were obtained from a previous survey by the Bank of Thailand, while the latter were based on an earlier study by the Thai Bankers’ Association.

1.16. To complete the picture of revenues and costs of providing payment services in Thailand, the figures on the Bank of Thailand's costs and revenues for each of the payment product the Bank facilitates were collected from the Accounting Group, the Deposits and Debt Instruments Group, the Information Technology Group, the General Administration Group, and the Payment Systems Group.

1.17. The only missing component of the overall costs and benefits of the payment systems is the costs and benefits associated with the end-users of the systems. While potentially very important, the time and resource limitations of this study did not allow the inclusion of such information, which could only be obtained through extensive and very careful surveys.

1.18. Interviews with individual commercial bank representatives were conducted mostly in November of 1999 with some occasional follow-ups later on. The interviewees were mostly those in charge of determining pricing strategy, calculating costs of services, and also those working at the policy-making level. Questions were asked about the method of cost calculation, issues or problems inherited with the current payment systems as well as suggested solutions, and suggestions on the appropriate role of the Bank of Thailand with regards to payment systems.

1.19. Two BOT-initiated workshops with the representatives of the commercial banks were held in early 2000 to gain feedback on the study progress, preliminary results and recommendations. After the study was completed, a major public hearing was held in August 2000 to which commercial banks, end-users, media, and academics were invited to discuss and comment on the study results.

1.20. Expert opinions were sought throughout the study. Two consultants from the World Bank were approached for advice. Written communication through formal letters and email was also maintained with academics and payment system experts in central banks in certain other countries.

Study Outputs

1.21. Two broad categories of recommendations emerge from this study: recommendations on pricing and non-price recommendations.

1.22. The recommendations on pricing include a recommended price caps structure, and two alternative price caps structures that place different weights on considerations set out at the beginning of this chapter. Rationales and implications of each pricing option are discussed at length.

1.23. The regulated prices are the ceiling prices, or the price caps. The commercial banks can charge lower fees if they so desire. This could be the case either because of increased efficiency in the payment systems or as part of the bank's business strategy.

1.24. The study recommends regular reviewing of the regulated price caps, to capture the changing payment technology and competition among the banks and non-bank payment service providers.

1.25. As with price recommendations, the study places great, if not greater, importance on non-price measures that should promote wider use of electronic payment systems. The non-price recommendations range from the development of electronic substitutes

to existing predominantly paper-based payment products, to the more comprehensive and collective efforts by various institutions and organisations to move the country toward electronic payment systems.

Chapter 2

Overview of Thai Payment Systems

Range of Payment Products

2.1. As in many other countries, developed and developing, cash is still by far the dominant means of payment in Thailand. However, unlike many developed countries where hard cash is mainly used for low-value transactions, it is believed that in Thailand a significant portion of medium-value and some high-value transactions are also completed through cash payments. This is particularly true in provincial areas, or when illegal transactions are involved.

2.2. For non-cash payment, cheques are widely used for business transactions and have gained popularity over the years especially in the Bangkok metropolitan and other urban areas. In 1998, more than three quarters of cheque transactions took place in the Bangkok Metropolitan Area (BMA) alone, accounting for nearly 98 percent of the total value.

2.3. The use of electronic payment systems began with the establishment by commercial banks of the on-line computer network, which allows electronic transfer of information between bank branches, including information on payment transactions. This on-line computer network facilitates various types of payment services, such as direct credit and direct debit where a mass of transaction orders are processed simultaneously from one account to many accounts (direct credit) or from many accounts to one account (direct debit). The services are, however, limited to intra-bank payments only, where both the payer and the payee must have their accounts with the same bank.

2.4. Another major advance in the electronic aspect of the payment systems was the introduction of the automatic teller machines (ATMs) which greatly reduced over-the-counter workload of human tellers. Although the few separate ATM networks at the beginning were later pooled into one national ATM network, making payments using ATMs was, nevertheless, restricted to intra-bank payments, until very recently. Recently, in June 2000, six large domestic commercial banks have launched an ATM-based inter-bank transfer system called On-line Retail Fund Transfer (ORFT).

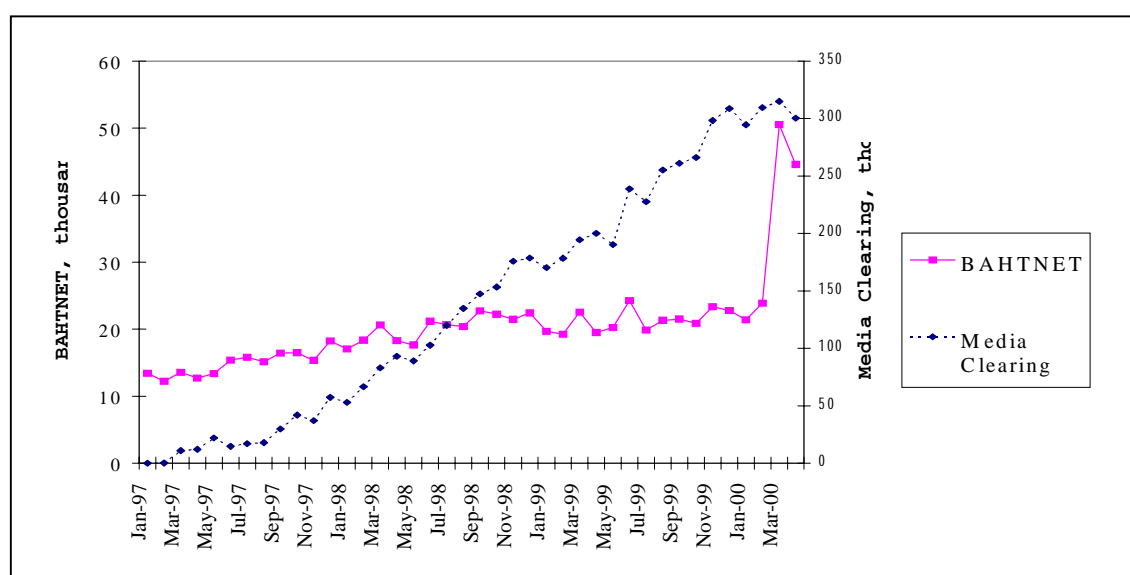
2.5. Except for the ORFT mentioned above, inter-bank payments could only be completed with cheques, drafts, cashier cheques or other paper-based means (e.g., money order, bill of exchange, promissory note). That changed when the Bank of Thailand introduced two inter-bank electronic payment systems: BAHTNET for high-value transactions and Media Clearing for off-line fund transfers.

2.6. BAHTNET, which commenced on May 1995, is a payment means designed to reduce systemic risks associated with high-value payments by using real time gross

settlement (RTGS). The Bank of Thailand requests the commercial banks and other members of BAHTNET that certain types of transaction must be completed only by means of BAHTNET. Since March 2000, almost all high-value transactions (i.e., those over 10 million baht) previously paid with cheques have come under BAHTNET.

2.7. In January 1997, the Bank of Thailand introduced Media Clearing, an off-line electronic means of fund transfer aimed primarily at facilitating payment transactions that take place on a regular basis, such as payrolls, dividends, interest payments, and payments of goods and services to supplier chains. It is worth noting that Media Clearing competes directly with commercial banks' in-house services of direct credit and direct debit. At present, Media Clearing is used only for direct credit.

Figure 2.1: Transaction Volumes of BAHTNET and Media Clearing, 1997 to 2000



Source: Bank of Thailand

2.8. As shown in Figure 2.1, the volume of Media Clearing has increased steadily since its introduction. This reflects its popularity since banks' corporate customers prefer this service to similar intra-bank services (direct credit) because unlike the latter it does not require the payee to have an account with the same bank as the payer.

2.9. On the other hand, the volume of BAHTNET did not show a clear upward trend. In fact, it seems to respond more to the BOT's occasional notifications requiring certain types of transaction to be carried out using BAHTNET. For example, the sharp surge of volume in March 2000 occurred when the BOT instructed the commercial banks to use BAHTNET for payments related to inter-bank lending, foreign exchange transactions, government securities trading and non-resident Baht account transactions. One can hypothesize that BAHTNET would not be the commercial banks' first choice for high-value payments. The reason could be the high cost of fund because the commercial banks have to maintain higher reserves, cash or bonds, with the BOT in order to be able to comply with the BAHTNET's real time gross settlement.

2.10. Apart from introducing new electronic payment products, the Bank of Thailand also sought to automate the process of payment with cheques. In July 1996, a central

facility called the Electronic Cheque Clearing System (ECS) was established within the BOT to speed up the process of cheque transactions. With ECS, commercial banks send cheque information to the BOT's central facility, which processes the information, net settles the balance between banks, and clears the balance. Since there is no need to send the actual (paper) cheques before the settlement (they are sent later to the ECS clearing center), there is a time gain as well as the accuracy of information processing from using the electronic payment products.

2.11. Other electronic means of payment include plastic cards (credit cards, debit cards, smart cards, prepaid cards, etc.), E-money, telephone banking and Internet banking. With the rapid advancement of computer, Internet, and telecommunication technology, these payment services will certainly gain wider use.

Supply and Demand of Payment Services

2.12. Currently, commercial banks are the primary providers of payment services. Although some non-bank competitors have entered the market (for example, some bill payment services by Seven-Eleven shopping stores), the range of services is still limited.

2.13. All commercial banks participating in the fee and cost surveys provide almost all payment services examined in this study to their customers. For fund transfers between banks themselves, cashier cheques, BAHTNET and BOT cheques appear to be the most used tools. Table 2.1 shows these results.

Table 2.1: Number of Banks Providing Different Payment Services

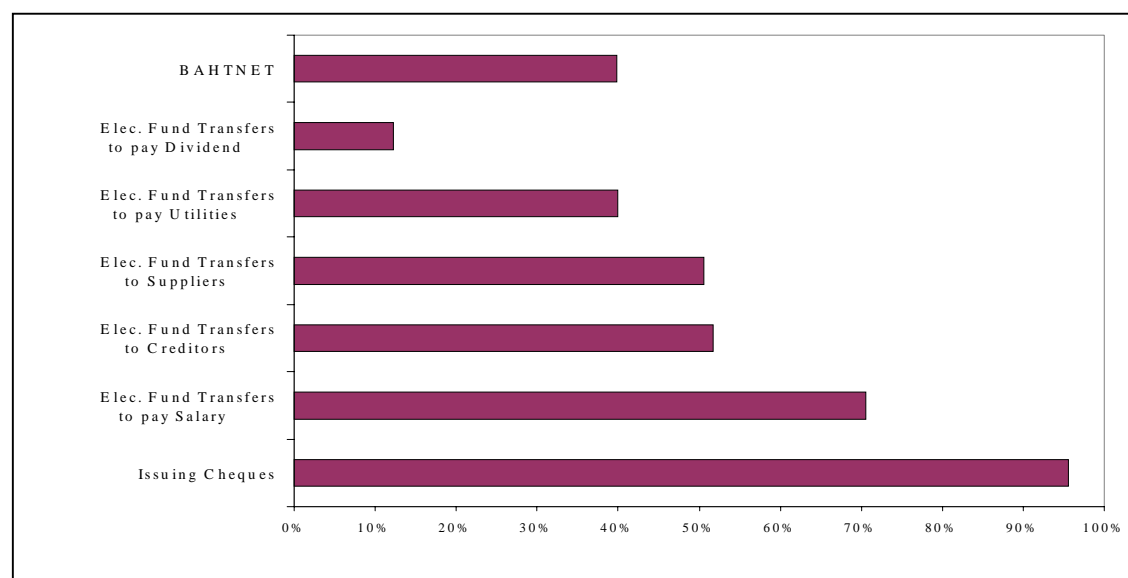
Type of Payment Service	For End-Users	For Interbank Fund Transfer
Cashiers cheque	11	11
Draft	8	-
Personal cheque	10	-
Corporate cheque	11	-
Direct debit	10	2
Direct credit	10	3
BAHTNET	11	10
Media clearing	11	3
Account-based money transfer	9	-
BOT cheque	-	7
Others	-	1 (SWIFT, TELEX)

Source: Bank of Thailand survey of Fee and Cost of Payment Services

2.14. Of late, some initiatives have been taken by non-bank providers on electronic business-to-business payment services. These initiatives are mostly made possible by the advances in telecommunication and Internet technology. Although the growth of internet-based payments is expected to be extraordinary, the industry itself is still quite premature and has to overcome many hurdles before IT-based payment becomes a full-fledged business

2.15. On the demand side, the results from the corporate customer survey reveal that cheques remain the most prevalent means of payment compared with other means, as can be seen in Figure 2.2.

Figure 2.2: Percentages of Corporate Using Each Payment Services



Source: Bank of Thailand

2.16. The use of cheques provides a number of advantages over other means of payment:

- Cheque is accepted as legal evidence the payee can use against the payer in court in cases involving non-honored cheques.
- Cheques are also frequently used as a form of promissory note (post-dated cheques), facilitating trade credit between business parties.
- Cheques are relatively cheap, compared with other non-cash means. payment

2.17. Of the 180 respondents of the corporate customer survey, 171 used at least one form of electronic fund transfer, either to pay salaries, dividends, or utility bills, for payments to creditors or suppliers, or using BAHTNET. Although this finding is an encouraging sign, it may suffer from sample selection problem. Only 21 companies returning the questionnaires had assets worth less than 10 million baht, and 19 of these employed less than 10 employees. Thus the high percentage of corporate customers using electronic payment products could simply be a distortion resulting from the predominance of relatively large-sized companies in the sample population. The size of companies, both in terms of asset and employment, is likely to affect the choice of payment product. The survey data, as shown in Table 2.2, seems to confirm this hypothesis. The smaller the firm, the lesser the likelihood of it using the various types of electronic payments.

2.18. Moreover, telephone interviews to follow-up on a small sample of 30 non-respondents revealed that a substantial fraction of corporate users either were not aware of the available electronic payment services (33%) or were aware but had never used

them (47%). The primary reasons given by the non-respondent corporate customers for not using electronic payment services include, lack of knowledge about the services, absence of a receipt to serve as a legal evidence, and expensive fees.

Table 2.2: Percentages of Companies Using Different Payment Services Classified by Employment Size

Payment Products	Employment Size					Total
	Less than 10	10-100	101-500	501-1000	1001+	
Cheques	100	95	100	96	97	98
Electronic Fund Transfer	79	71	83	89	84	81
To pay Suppliers	53	74	80	89	92	79
To pay Creditors	79	81	76	89	95	83
To pay Utilities	58	79	93	96	100	88
To pay Salary	58	67	76	71	78	72
To pay Dividend	0	0	2	0	3	1
BAHTNET	58	64	76	96	95	78
Sample Size (no. of firms)	19	42	54	28	37	180

Source: Bank of Thailand Corporate Customer Survey

2.19. Even among the respondents, some shied away from using certain electronic payment products for various reasons. Table 2.3 lists the reasons the respondents specified as the most important for not using a given electronic payment system. It shows that lacking computer facilities hinders most means of electronic payments, especially the BAHTNET. Lack of good internal control (to prevent corruptive abuse within firms) and the requirement of the receivers also plays significant roles. Paying for utilities expenses electronically faces most obstacles: apart from the same reasons as other electronic payments, it also suffers from the payers' lack of trust on the receivers; the payers' unwillingness to pay too quickly while unable to cancel the payments if something goes wrong.

Table 2.3: Reasons for not using the specific Electronic Payment Product (numbers of companies citing the reason as the most important factor)

Most Important Reasons	Electronic Fund Transfers to pay				BAHTNET
	Creditors	Utilities	Salaries	Dividend	
Lack of criminal law protection	5	5	3	3	3
Lack of good internal control	13	14	11	11	3
No computer facilities	24	19	21	16	29
Complying to receivers	20	15	5	13	5
Do not trust receivers	6	14	0	1	2
Must go to the banks	7	8	11	2	8
Pay too quickly	10	15	2	3	1
Unable to cancel payment	7	14	2	4	1

Source: Bank of Thailand Corporate Customer Survey

2.20. Other reasons were also cited. These include:

- Need to verify the transaction before transferring money (creditors, utilities).
- Need receipts as a legal evidence of payment, for accounting and tax purposes (creditors, utilities)
- Expensive fee (BAHTNET, dividend).
- Inavailability of products at bank branches (salaries) or unaware of available services (BAHTNET, creditors).
- Not enough transaction volume (salaries).

2.21. The above findings on the factors that deterred the sampled corporate end-users from using some electronic payment services give some hints on the necessary measures to promote their use. When asked what conditions must be met before they started using more electronic fund transfer, the overwhelming majority pointed, as shown in Table 2.4, to the need for better laws to promote and protect electronic fund transfer, timely transaction statements, on-line banking, and cheaper computing and telecommunication facilities.

Table 2.4: Desirable Conditions for Increasing Electronic Payment Service Use

Desired Conditions	% of Respondents
Criminal law to protect electronic fund transfer	72
Electronic Fund Transfer Law	75
Commercial banks provide daily transaction statements	82
Commercial banks provide weekly transaction statements	65
Should be able to initiate on-line fund transfer	67
Commercial banks transfer fund on-line	62
Cheaper computers, software, leased lines, communication channels	70

Source: Bank of Thailand Corporate Customer Survey

2.22. As for price factors, the survey discovered mixed results. Many corporate end-users did not regard price or service fee as a principal determinant of the choice of a payment service, arguing that non-price factors such as those already discussed are more important. On the other hand, many companies contended that cheque price should be kept unchanged while lowering the fees for electronic payment services to promote their use. Yet another group indicated that cheque price should be increased to discourage their use.

2.23. There does not appear to be a strong relationship between cheque fees and the electronic payment service fees the end-users were willing to pay. Table 2.5 ranks the reservation fees (the maximum fees the end-users are willing to pay) for two electronic payment products, viz., the electronic fund transfer to pay salaries and the BAHTNET, when personal cheques were hypothetically priced at 7, 10, 15, and 20 baht. The highest percentage of corporate end-users preferred paying 100 baht for BAHTNET (the current fee is 250 baht) and 10 baht for EFT salary payment, quite independent of the prices of personal cheque. However, the average reservation fees increased slightly with cheque fees (as the distribution of reservation fees skew more toward higher value when cheque prices increase), indicating some degree of relationship.

Table 2.5: Reservation fees for EFT (salary) and BAHTNET at Various Cheque Prices

	Reservation Fees when Cheque Prices are			
	7 baht	10 baht	15 baht	20 baht
Electronic fund transfer to pay salaries				
First reservation fee	10	10	10	10
Second reservation fee	5	5	5	5
Third reservation fee	15	20	15	20
Average reservation fee	9.2	12.9	11.5	12.9
BAHTNET				
First reservation fee	100	100	100	100
Second reservation fee	250	250	250	250
Third reservation fee	50	50	50	50
Average reservation fee	118.3	121.0	125.7	128.2

Source: Bank of Thailand Corporate Customer Survey

Note: The first, second and third reservation prices are determined by the number of companies nominating these prices.

2.24. The impression that fee prices do not play a significant role in the choice of payment products must be viewed with caution. Again, it may be recalled that the respondent corporate end-users were relatively large companies that tend to be willing to pay a much wider range of fees for products that suit their business. The findings could have been different if more small companies and personal end-users had been included in the survey.

2.25. It is clear, then, that much remains to be done to promote the use of electronic payment services. Measures relating to both price and non-price factors must be devised and implemented. These are discussed in Chapters 5 and 6, respectively.

Chapter 3

Incomes and Costs of Thai Payment Systems

Types of Payment Incomes

3.1. Payment income earned by commercial banks can be divided into two categories, namely, fee income and float income. Fee income is derived directly from payments made by customers for using the bank's services, while float income is generated from idle balances during the collection process, defined as the benefit commercial banks enjoy during, and as a result of, the time interval between the debiting and the crediting of the customer's bank account.

3.2. Fee income can be categorized further into fixed fees such as annual fees, and transaction fees. This study puts more emphasis on transaction fees (see Box 3.1)

3.3. Transaction fee may consist of two parts: the first part pertains to the transferring of payment information (who pays how much to whom at what time) and settlement, and the extra, second part applies primarily when there is physical movement of money or cash. The second part of fees usually varies with the amount of money transferred, and is sometimes waived under certain circumstances. For example, a payment through BAHTNET involves a fixed fee of 250 baht when the payer and the payee are both located within the Bangkok Metropolitan Area (BMA). An additional fee of 0.1 percent of the amount transferred (but not exceeding 750 baht) applies when either the payer or the payee is living in provincial areas, or when they are living in different provinces.

3.4. The extra charge to the payer or the payee living in provincial areas is not confined only to the BAHTNET. It also applies to cheques, direct debit, direct credit and account-based money transfers. Although distance appears to be the primary criterion for the provincial extra charge, for some products it applies when the fund transfer involves different "clearing houses", i.e., when the payer and the payee do not live in the same area that is serviced by a single clearing house.

3.5. It is not clear whether the extra fees levied on provincial customers are fair. If the costs of managing funds to honour the payment orders are not much different between the payments made within the BMA and those made across provinces (i.e., the cost differences are less than those implied in the fee differences), then the customers in the BMA would appear to be enjoying a certain level of subsidization from those in provinces. One possible explanation for this practice by commercial banks is that the extra fees are used to cover the expense related to cash handling because provincial people tend to use cash much more than Bangkok residents. A further study on this issue is warranted.

Box 3.1: Fees Currently Charged by Commercial Banks

Paper-Based Payment Products

- 1) *Cashier Cheque*: The Charge for issuing a cashier cheque varies among commercial banks. Some may provide it with no charge while the others may charge up to a maximum of 500 Baht per cheque.
- 2) *Draft*: Charges for a draft are based on the payment value as follows: a charge of 10 baht for the first 10,000 baht and 5-10 baht for the exceeding amount.
- 3) *Personal/Corporate Cheque*: Charge at 5-6 baht per cheque.
- 4) *BOT Cheque*: Issued by BOT with no charge for those financial institutions and government agencies that maintain a deposit account with BOT.

For cheques (1)-(3), most banks charge a collection fee of 0.2 percent of the amount collected (with a minimum fee of 10 baht). A stamp duty of 3 baht is levied on every paper-based payment product. Commercial banks send these duties to the Revenue Department on a monthly basis.

Paperless Payment Products

- 5) *Direct Debit/Credit*: These apply to fund transfers within the same bank. Direct Debit is usually used for the payment of utility bills, wherein the customer prepares payment information for the bank either in the form of a diskette (when the volume is large) or in the form of a printed (hard) copy. Charges vary from 5 to 40 baht for transfers within the Bangkok Metropolitan Area and additional 10-30 baht for transfers to or between provinces. Direct Credit charges vary from 5 to 500 baht for transfers within the BMA and additional 10-30 baht for provincial transfers.
- 6) *Account-Based Money Transfer*: Commercial banks usually charge no fee for transfers within the BMA but charge 10-30 baht for each 10,000 baht of the payment value and 20 baht for the use of a leased line for transferring funds across provinces.

For (5) and (6), some banks may charge an annual fee, which is usually around 500 baht.

- 7) *BAHTNET third party funds transfer*. The fee is 250 baht per transaction, which is split between the sending bank (150 baht) and the receiving bank (100 baht). Extra fee may be levied depending on the origin and destination of payments as described below.
 - Fund transfer within the BMA: no extra fee.
 - Fund transfer from the BMA to provincial areas: the fund receiver pays 10 baht for each 10,000 baht received with a ceiling of 750 baht
 - Fund transfer from provincial areas to the BMA: the sender pays 10 baht for each 10,000 baht sent, with a ceiling of 750 baht.
 - Fund transfer between provinces: the receiver pays 10 baht for each 10,000 baht received with a ceiling of 750 baht.
- 8) *ECS*: Fees for cheque collections are already charged according to (1)-(3) above. Returned cheques from ECS clearing center are charged 200 - 400 baht each.
- 9) *Media Clearing*: There are no extra charges for provincial fund transfers.
 - Sending bank: 3.50 baht per transaction
 - Receiving bank: 5.90 baht per transaction
- 10) *Provincial Cheque*
 - Inter-Provincial cheque: 20 baht for each 10,000 baht payment value, with a price floor (minimum fee) of 10 baht.
 - Intra-Provincial cheque: 20 baht for each 10,000 baht payment value, with a price cap between 10 and 300 baht
 - The fee for a returned provincial cheque is the same as ECS (200-400 baht).

Fee Setting

3.6. From the BOT fee survey of 13 commercial banks, it is apparent that most banks still charge for many of their payment services well below the actual cost. For instance, cheques honoured in the BMA are provided free of charge since they are seen as a tool to attract customers to use other bank services through which the bank will gain benefits such as overdraft interest or deposits.

3.7. Table 3.1 shows that recovering the cost was not the primary concern for most of the banks, although revenue, profit and fee-based maximization concepts were also adopted. Eight banks indicated that providing payment services was seen as a mean to keep the existing customers and at the same time attract new customers. It is not uncommon that major customers are charged reduced fees or even serviced free of charge.

Table 3.1: Objectives of Fee Setting by Commercial Banks (unit: numbers of banks)

<i>Factors</i>	<i>Very Weak</i>	<i>Weak</i>	<i>Fairly Strong</i>	<i>Strong</i>	<i>Very Strong</i>
Revenue maximization		1	10		
Profit maximization		1	10		
Fees-based income maximization		1	9	1	
Cost recovery			2	4	5
Market leadership		5	2	3	1
Customer service				3	8
Expanding customer base			2	1	8
Corporate image			1	4	6
Social responsibility			2	3	6

Sources: Bank of Thailand First Fees and Cost Survey of 13 commercial banks

3.8. The bank's reputation (corporate image and social responsibility) was also mentioned as a very strong underlying basis for fee setting. This probably is the primary reason why banks have not been very keen on increasing payment service fees individually. Fees are usually set collectively (via the Thai Bankers' Association or the Foreign Bankers' Association) or after seeking BOT approval.

3.9. Although commercial banks only want to increase fees cautiously, the pressure on them to rely more on fees might have been mounting increasingly over the past several years. Reduced income from a shrinking interest spread due to the economic downturn and a large percentage of NPLs (non-performing loans), together with a dwindling float income (see the next section) has been forcing commercial banks to find other ways of raising revenues.

3.10. The fees the Bank of Thailand collects from commercial banks (see Box 3.2), are set primarily at relatively low levels so as to provide incentives to commercial banks and end-users alike to increase the use of electronic means of payment.

Box 3.2: Fees Currently Charged by the Bank of Thailand

The Bank of Thailand (BOT) charges a fee to the commercial banks and other financial institutions for services it provides. These are:

- 1) *BAHTNET*: The Fee varies for the services under the BAHTNET facility as follows.

Fund transfer	10 baht per transaction
Third party fund transfer	12 baht per transaction
Bilateral communication	6 baht per transaction
Message broadcasting	50 baht per transaction
Monthly fee	3,500 baht per work-station
- 2) *ECS*: The fee is charged to both the sending and the receiving bank, as follows.

Collecting bank	0.2 baht per cheque
Paying bank	0.4 baht for ECS settlement and cheque sorting by the BOT. An additional 0.6 baht may also apply if the paying bank requires the BOT to sort cheques further by branch and account number.
- 3) *Media Clearing*: Only the sending bank is charged 0.6 baht per transaction for sorting and settlement services.
- 4) *Provincial Cheque*: A fixed annual fee of 1,000 baht per bank branch is charged for the provincial cheque settlement service.

Float Income

3.11. In many countries including Thailand, float income from servicing payment transactions forms a significant part of payment income of the commercial bank. Float income can be derived from a number of channels.

3.12. First, float income arises from the time lag between the debiting of payers' accounts and the crediting of payees' accounts. During that time interval, the funds are available to the bank without costing any interest payment. In Thailand, examples of this include inter-provincial cheque settlement and Media Clearing. For inter-provincial cheques, the Bank of Thailand requires that the paying bank notify the collection result to the customer, via the collecting bank, within six working days. This is called the 'Bill for Collection' or BC procedure. If the paying bank is able to credit its customer's account in less than six working days, it will benefit from the float income. It is estimated that the average number of days that generate float income under the BC procedure is about two days.

3.13. In Media Clearing, many sending (paying) banks debit their customers' accounts two days before clearing with the receiving banks at the Bank of Thailand, which is the time when the receiving banks' customers get credited. Thus for Media Clearing as well, the period over which float income is generated is about two days, although this is about to change to one day by the BOT requirement.

3.14. The second channel for generating float income is through the bank's ability to pay interest rates that are lower than the time deposit interest rates, in exchange for providing payment services. The prime example is the requirement that customers who want to use cheques must have current accounts, which normally carry zero or low

interest rates. The minimum balance requirement on savings accounts can also be classified into this category.

3.15. The third channel is through the holding of fund withdrawal after the payees' accounts have been credited. The ECS and intra-provincial cheque settlements, where the customers have to wait one day before making the withdrawal, are good examples. Although the real reason for holding the withdrawal is to complete the returned cheque process, the funds are nevertheless available to the bank for channeling to other uses.

3.16. Float income has declined over the past few years, due mainly to three developments in the Thai payment systems. The first development is the decline of the average balance on current accounts following the introduction of automated debiting/crediting between the current account and other bank accounts that give higher interest rates. The second development is the shortening of the notification time under the BC procedure for inter-provincial cheques. And the third development is the migration of high-value payments from the net settlement with cheques to the gross settlement with BAHTNET. Moreover, the sharp reduction in the interest rates since 1998 following the economic recession has caused the float income to dwindle even further.

3.17. Although the minimum balance requirements have become a norm, it is unlikely to arrest the downward trend of float income because most customers want to keep the account balance above the minimum balance anyway, with or without that requirement.

3.18. The reduction in float income has made the commercial banks more enthusiastic in raising direct fees, as well as starting to collect annual fees.

Costs of Payment Systems

3.19. In general, the costs of payment systems incur to two parties, the service providers and the service users. While the user pays for the provider's costs (partly, in the case of subsidization by the provider, or excessively, when the provider makes extra profits), there are also other costs directly borne by the end-user. These are, for example, the time cost, or the opportunity cost, that the end-user has to forgo in order to complete the transaction. Other costs include transportation cost, if the payment requires the end-user to make a trip (e.g., to the bank), and the facility costs such as computers and telecommunication lines. All these pecuniary and non-pecuniary costs play important roles in determining the end-user's choice of payment services.

3.20. The present study only examines the costs to the service providers, which are primarily the commercial banks and the Bank of Thailand. The costs to the end-users are more difficult to quantify and are potentially subject to higher variability across users than the variability of cost across service providers.

3.21. The cost figures presented in this study are derived from the BOT second cost survey due to its higher data quality compared to the first cost survey (see Chapter 1 for more details on the two surveys and Appendices B and C for each survey questionnaire).

Table 3.2: Example of Adjustment of Surveyed Cost Information (Cost figures from sending banks of BAHTNET third party fund transfer)

Process/Cost Item	Commercial Banks							Average 1-5*
	1	2	3	4	5	6	7	
Variable Cost								
Data processing cost at HQ ¹								
<i>before adjustment</i>	26.8		27.7	2.3	7.6	10.0	2.0	16.1
<i>after adjustment</i>	10.0	10.0	10.0	2.3	7.6	10.0	2.0	8.0
Data processing cost at branch ²								
<i>before adjustment</i>	82.6	25.5	23.1	17.2	64.7	15.0	5.6	42.6
<i>after adjustment</i>	25.0	25.5	23.1	17.2	20.0	15.0	5.6	22.2
BAHTNET processing cost ³								
<i>before adjustment</i>	9.7	164.6	15.6		33.9	8.0	5.3	55.9
<i>after adjustment</i>	9.7	10.0	7.4	8.0	10.0	8.0	5.3	9.0
Fixed Cost								
Depreciation of workstations and host computer								
<i>before adjustment</i>			8.3				34.8	8.3
<i>after adjustment</i>	10.0	10.0	8.3	10.0	10.0	10.0	34.8	9.7
Maintenance of workstations and host computer								
<i>before adjustment</i>							14.9	0.0
<i>after adjustment</i>	10.0	10.0	10.0	10.0	10.0	10.0	14.9	10.0
Utilities								
<i>before adjustment</i>	0.6	72.0	0.7	1.8	7.6	3.0	4.8	16.5
<i>after adjustment</i>	0.6	10.0	0.7	1.8	7.6	3.0	4.8	4.1
Supplies								
<i>before adjustment</i>	11.3		0.3	1.2	4.1	2.0	86.6	4.2
<i>after adjustment</i>	4.0		2.0	1.2	4.1	2.0	86.6	2.8
Continue Printing paper								
<i>before adjustment</i>	11.4		3.7	1.5	0.5	3.0	3.0	4.3
<i>after adjustment</i>	4.0		3.7	1.5	0.5	3.0	3.0	2.4
Leased telephone line								
<i>before adjustment</i>	1.3	3.0	1.4	3.6	0.3	2.0	9.5	1.9
<i>after adjustment</i>	1.3	3.0	1.4	3.6	0.3	2.0	9.5	1.9
Before Adjustment								
Variable Cost	119.1	190.1	66.4	19.5	106.2	33.0	12.9	100.3
Fixed Cost	24.6	75.0	14.3	7.9	12.5	10.0	153.7	26.9
Total Cost	143.7	265.1	80.7	27.5	118.7	43.0	166.5	127.1
After Adjustment								
Variable Cost	44.7	45.5	40.5	27.5	37.6	33.0	12.9	39.2
Fixed Cost	29.9	33.0	26.0	27.9	32.5	30.0	153.7	30.9
Total Cost	74.6	78.5	66.5	55.5	70.1	63.0	166.5	70.1

Source: BOT second cost survey

Notes: 1 consists of costs of request form, transaction verification and posting

2 consists of transaction verification costs

3 consists of costs of data entry and verification

* Banks 6 and 7 are excluded from the averaging because, being overseas banks, they do not have branch networks.

3.22. Before the cost figures were used, they were first adjusted for consistency. Table 3.2 presents one example (sending banks of BAHTNET third party funds transfer) of how cost figures are adjusted. Cost figures were compared for each process/cost items across banks, and when figures from the minority of banks contradicted significantly with those from the majority of banks, they were adjusted to be more comparable with the latter.

3.23. For the most part, costs figures were adjusted downward with this procedure. This is because a few banks did give unjustifiably high cost figures, when compared with the same cost items from most other banks. If those high costs were accurate, one can then argue that they represented inefficiency within those banks, and that their figures should not be directly used; otherwise the pricing that bases on these numbers will be endorsing inefficiency. Discussions on appropriate price regulations are presented in more detail in Chapter 5.

3.24. The cost figures in each process/cost item were then averaged. The averages are not weighted by the transaction volume from each bank. There are two reasons why a simple average is chosen. First, the volume numbers are not complete, as some banks did not give volume data for some of their products. Second, volumes are highly concentrated in 2-3 large banks, hence weighted averaging will be dominated by cost figures from these banks.

3.25. Moreover, cost figures from two banks that have no branch besides the head office (being foreign banks they are not allowed to have branches), were not included in the averaging exercise. They were excluded because their cost figures tend to be quite different from the other banks with branch networks. As majority of end-users will get their services from banks with at least some branches, it is then reasonable to use the cost figures only from banks with branches. The adjusted costs of payment services are shown in Table 3.3.

3.26. Table 3.3 suggests that the variable cost for cheques tends to be generally higher than the fixed cost. Also, its proportion in the total cost is much higher for cheques than for electronic payment products. Cheque costs are associated with printed forms, customer service, printing, encoding, cheque transportation, and on-line data processing at the bank's central office.

3.27. Electronic payment services, on the other hand, tend to have a higher fixed cost than cheques. The fixed costs mainly comprise the depreciation and maintenance costs of computer equipment, utilities, fixed supplies, and leased telephone lines for on-line transactions. Such concentration of fixed costs opens room for economy of scale in the processing of electronic payments and further reduction in fees when transaction volume increases, so that these fixed costs are spread over a larger number of transactions.

Table 3.3: Estimated Costs of Payment Services (baht per transaction¹)

	Total Cost	Variable Cost	Fixed Cost
Paper-based services:²			
Cheque settlement, via ECS (combined cost)	16.9	6.9	10.0
- <i>Collecting bank</i>	10.1	4.1	6.0
- <i>Paying bank</i>	6.8	2.8	3.9
Draft	13.4	12.2	1.2
Cashier cheque	11.4	10.2	1.2
Personal cheque	9.1	8.6	0.5
Corporate cheque ³	9.1	8.6	0.5
Inter-provincial cheque	64.7	13.5	51.2
Intra-provincial cheque	63.9	16.0	47.9
Electronic services:			
BAHTNET (Interbank fund transfer, combined cost)	80.9	50.0	30.9
- <i>Sending bank</i>	58.3	32.6	25.7
- <i>Receiving bank</i>	22.6	17.5	5.2
BAHTNET (Third party fund transfer, combined cost)	117.1	67.5	49.6
- <i>Sending bank</i>	70.1	39.2	30.9
- <i>Receiving bank</i>	47.0	28.4	18.7
Media clearing (combined cost)	12.7	7.6	5.1
- <i>Sending bank</i>	6.6	4.2	2.4
- <i>Receiving bank</i>	6.1	3.4	2.7
Direct debit (combined cost)	5.3	3.7	1.6
- <i>Data preparation</i>	3.0	2.5	0.5
- <i>Data posting</i>	2.3	1.2	1.1
Direct credit (combined cost)	4.5	2.2	2.3
- <i>Data preparation</i>	2.2	1.7	0.5
- <i>Data posting</i>	2.3	0.5	1.8

Source: BOT Second Cost Survey

Notes: ¹ Figures are based on the average cost for banks with branches. Some figures may not add up due to rounding. ² All cost figures for paper-based services include a stamp duty of 3 baht each. ³ Average cost for corporate cheques is similar to that for personal cheques

3.28. Note that there are some cost items the commercial banks counted as costs but are excluded from Table 3.3. These are:

- **Media Clearing.** Many receiving banks claimed that accepting Media Clearing, which is used by small or retail customers, usually entailed extra cost for cash reserving at branches, costs of operating ATMs, and cost of customer services (when customers make frequent calls to check for fund crediting). All these claims could be valid if all, or most, of customers the banks obtained through Media Clearing behaved differently from other customers in terms of withdrawing cash. Otherwise, these customers would not post additional costs to the banks than those costs the banks had already anticipated when investing in ATMs or opening branches.
- **BAHTNET.** A few sending banks counted costs of higher fund under real time gross settlement (RTGS) of BAHTNET. It is excluded from the payment costs here on the grounds that these additional costs of fund are similar to 'risk premium' paid to avoid or reduce system risks to the banks, and thus should be borne by the banks. Also, the safety gains through RTGS should not be exclusively attributed to payment systems alone, as all the other bank operations also benefit.

- **BAHTNET.** One bank argued that accepting fund transfer via BAHTNET sometimes caused costs of physical cash movement to small branches the payments were destined to, because those branches did not have enough reserves to honour high-value withdrawal following BAHTNET transfers. The study excludes this cost item on the grounds that it is not clear how often these additional physical cash movements really take place. If the incidents are infrequent, the normal charge of BAHTNET could be sufficient to cover these costs.

3.29. It is possible, however, that some of the claims on additional costs related to Media Clearing and BAHTNET were accurate and the costs involved significant. Nevertheless, the concerns raised by the commercial banks about these additional costs can be better viewed as relating to the more central issue: that there is an unfair access to branch networks of large domestic banks by some banks that have no or limited numbers of branches. This issue will be addressed separately in the formation of price recommendations (Chapter 5) and should not influence the basic cost figures presented in Table 3.3.

Revenues and Costs of BOT Payment Services

3.30. Table 3.4 summarizes the estimated revenues and costs to the Bank of Thailand in providing various central bank payment services. The figures were calculated and estimated from the operations of various departments within the Bank that are concerned with payment services.

3.31. Based on the total cost concept, the BOT has been subsidizing all payment services it provides, the largest of which are BAHTNET, ECS and Media Clearing. The total subsidization was 120 million baht in 1998. The figures differ when the variable cost concept is adopted. The total subsidization drops to 16.5 millions with ECS making some surpluses, while the BAHTNET subsidy decreases sharply due to its large fixed cost component.

Table 3.4: Estimated Costs and Revenues of the BOT, 1998 (million baht)

Payment Service	Volume in 1998	Fee Revenues	Total Costs (TC)	Variable Costs (VC)	Fees - TC	Fees - VC
BAHTNET	243,127	6.3	48.5	8.9	-42.2	-2.6
Media Clearing	1,397,379	0.8	22.2	10.1	-21.4	-9.3
ECS	53,773,018	62.2	88.1	37.9	-25.9	24.2
BOT cheque	29,285	-	16.5	15.5	-16.5	-15.5
Provincial Fund Transfer	103,116	6.2	20.3	19.5	-14.1	-13.4
Total		75.5	195.6	92.0	-120.1	-16.5

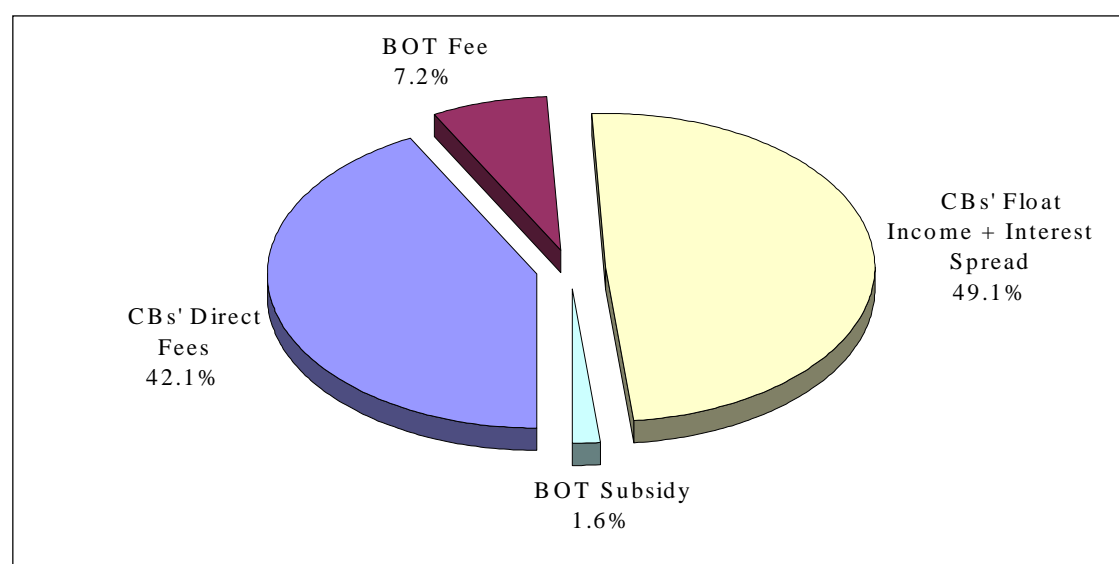
Source: BOT internal calculations

Notes: Fee figures are calculated from the fee structure (see Box 3.2 above). Cost figures are based on past figures, assuming low increases in input prices before 1998. BAHTNET and Media Clearing cost figures are 1997 data, ECS figures are based on 1996 data, and BOT cheques and provincial fund transfer figures are 1998 data.

Implications of Subsidization

3.32. The complete data of volume, fees and cost of payment services under this study enable the comparison of the overall revenues and costs of payment services in Thailand. This is shown in Figure 3.1.

Figure 3.1: Recovery of Total Variable Cost (1,055 mil. Baht) in 1998



Source: Calculated from BOT Fees and Second Cost Surveys

Notes: CBs: Commercial Banks; BOT: Bank of Thailand

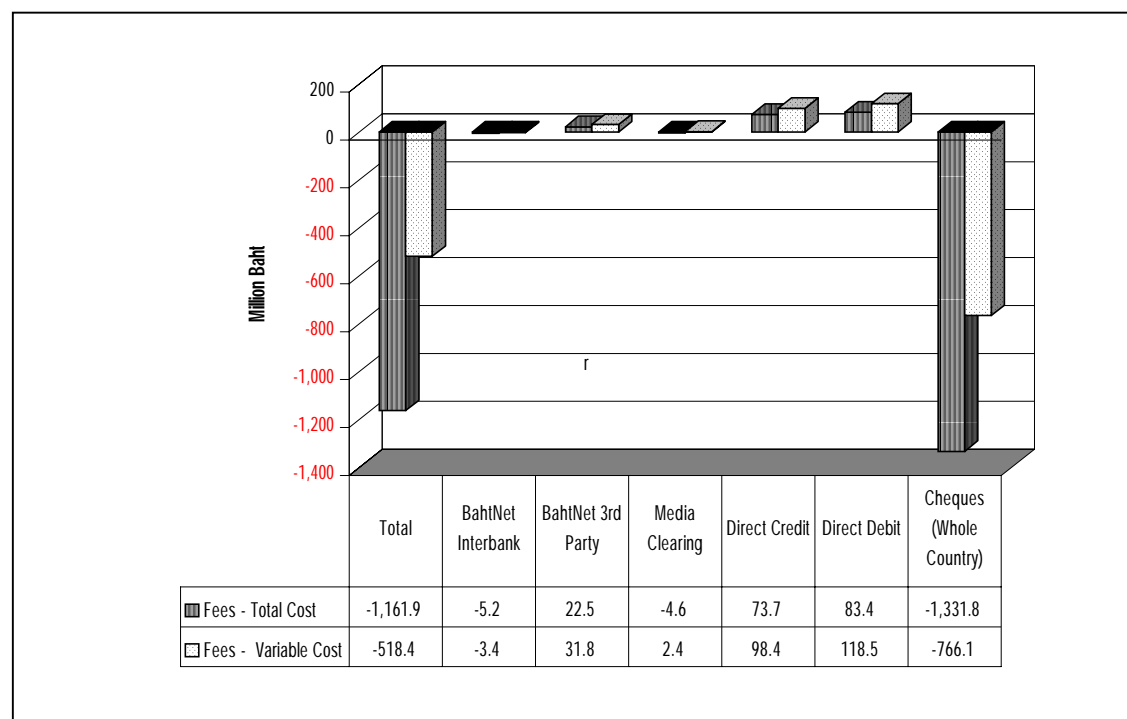
3.33. It is clear from Figure 3.1 that, as in many other countries, the payment systems in Thailand are subsidized. In 1998, direct fees accounted for less than half of the total variable cost (42.1% of fees collected by commercial banks and 7.2% by the Bank of Thailand). The remaining variable costs were recovered with float income (which has been on the decline), interest spread and direct subsidization from the Bank of Thailand.

3.34. The overall subsidization depicted in Figure 3.1 can be broken down to find its source by payment products. This is shown in Figure 3.2.

3.35. From the commercial banks' point of view, the overall subsidization is as high as 1.16 billion baht annually. Part of this will be covered by float income and interest spread. However, as float income continually declines, and given the difficulty in extending more credits, it is natural that banks have recently become more aggressive in raising fee incomes.

3.36. Servicing cheques is the major cause of subsidization within the payment systems. In fact, when only the variable costs are considered, cheques were the only source of subsidization by commercial banks in 1998 (losses accrued to the BAHTNET interbank fund transfers could not be meaningfully counted as losses, as these are services commercial banks use for themselves, i.e., the banks are also the end-users).

Figure 3.2: Differences between Fees and Cost by Payment Product Provided by Commercial Banks in 1998 (million baht)



Source: Calculated from the BOT Fees and Second Costs Surveys

3.37. The fact that profits are made from some electronic payment systems (especially direct debit and direct credit) suggests a certain level of cross substitution biased toward paper-based products such as cheques by commercial banks. This practice clearly jeopardizes the development of electronic payment systems.

3.38. The cross-subsidization against electronic payment products is unlikely to be the design of the commercial banks. It more likely stems from the difficulty in increasing cheque fees. The commercial banks, with the objective of keeping their customers pleased, provide some basic services for zero or subsidized fees. Since many customers prefer using cheques to other means of payment, commercial banks are reluctant to raise cheque fees for the fear of losing their customers to their competitors.

3.39. However, not all customers receive the same treatment from commercial banks. While banks may want to please certain groups of customers (usually medium- to large-sized companies) and offer them privilege services, the pressure to increase fees is likely to fall on other, less favorable, customers. Raising cheque fees for these customers would have followed, had the Bank of Thailand (de facto) not regulated the fees on cheques.

3.40. It is only natural, then, that new services—which mostly are electronic—are priced more aggressively than the traditional ones. Unfortunately, this situation will encourage end-users to continue using traditional means of payments. Electronic payments may then become a luxury for the trendy and high-end customers for moving funds around, or they will be used only when really needed, e.g., when timing or security of transfers is the prime concern.

Chapter 4

International Experiences in Pricing Payment Systems

Overview

4.1. Before making recommendations on a suitable price structure for Thai payment systems, it would be beneficial to learn lessons from other countries. First, an overview of central bank pricing policies is provided in this section. Thereafter, four countries, each having unique payment pricing experiences, are reviewed in the following sections. They include the United States, Norway, Australia and the United Kingdom.

4.2. Service providers, banks and non-banks alike, across countries have varying pricing policies—from providing free services to targeting certain rates of return. A survey of central banks in the Bank of England Group found that a majority of industrial and transitional countries priced their services on the basis of full-cost recovery, as compared to a large majority of developing countries that provided free services. Subsidization of payment services were also the policy of choice for some transitional countries as they underwent reform programmes and moved from centrally planned to market based economies. Table 4.1 summarizes this finding.

Table 4.1: Central Bank Pricing Policies (percent of countries in each group)

Type of Pricing	Industrial Countries	Transitional Countries	Developing Countries
Free	5	8	61
Subsidization	0	25	3
Full-Cost Recovery	90	42	27
Target Rate of Return	0	17	0
Other	5	8	9

Source: Fry *et al.*, (1999, p. 78)

4.3. In the major developed countries like the United States, the United Kingdom and Japan, central banks have followed pricing policies geared toward a full cost recovery. This is illustrated in Table 4.2. Payment charges take various forms, including minimum charges, monthly electronic connection fees, monthly participation fees, annual fees for maintaining settlement accounts with the central bank, and 'per transaction' fees, which may have differing rates based on the value of funds transferred.

Table 4.2: Comparison of Pricing Policies in the United States, United Kingdom and Japan

Country	Payment System (s)	Pricing Policy	Notes
United States	Cheque Clearing Networks	Fed (Federal Reserve) fees for cheque collection are based on the MCA guidelines. Fees for cheque collection services vary based on the deposit time and the sorting amount performed by the depositing institution. On a volume basis, Fed per-item fees averaged around US\$ 0.022 per cheque (1993 figure).	
	ACH	Fed national ACH services include the following fees (1993 figures): (a) monthly electronic connection fees, which vary based on the type of connection; (b) a US\$ 10 monthly participation fee; a US\$ 1.50 fee for each file deposited; and (c) a US\$ 0.01 fee for each local transaction and US\$ 0.015 for each interregional transaction originated or received.	Automated Clearing House (ACH) is a fully electronic batch-processing system.
	Fedwire	Fed Fedwire services include the following fees (1993 figures): (a) a US\$ 1.06 funds transfer fee, whereby US\$ 0.53 is paid by the originator and US\$ 0.53 is paid by the receiver; and (b) a monthly computer connection fee, including US\$ 700 for a dedicated or computer interface link, US\$ 300 for a shared leased-line link, and US\$ 65 for a dial-up link.	Fedwire is a large-value payment system operated by the Federal Reserve (Fed) System
	CHIPS	There is a minimum charge of US\$ 1,500 per month. High volume users (over 80,000 messages a month) are charged US\$ 0.13 for each message sent or received. Other users are charged by the type of message sent.	Clearing House Interbank Payment System (CHIPS) is a private large-value payment system operated by the New York Clearing House Association. NYCHA allocates its total costs of operations among its participants according to CHIPS usage (the number of messages sent and received during the previous month).
United Kingdom	CHAPS	The fee a settlement bank charges its indirect participants or customers is a matter for commercial negotiation between the concerned parties. Settlement banks have to pay an entry fee plus a share of the operating costs (normally set in proportion to their share of the total volume and use of facilities), but they do not have to pay any per item fees for using the system. Following the introduction of the RTGS in 1996, the Bank of England charges a per item tariff for each CHAP transfer settled, and an annual fee for settlement accounts in order to cover the costs of running its real-time accounting system; the costs of the Enquiry Link are recovered by an annual charge levied on each terminal connection.	Clearing House Automated Payment System (CHAPS) is a large-value payment system, of which sixteen banks and the Bank of England are settlement members (as of 1996) The Bank of England's charging policy is based on the principle of recovering the fully allocated costs of the banking services it provides.
Japan	Zengin	Participating banks charge their customers for using the system. Fund transfer fees vary among banks. The following are some examples of fees in 1993: (a) Yen 412 (US\$ 3.9) for transfers less than Yen 10,000 (US\$ 93.9); (b) Yen 515 (US\$ 4.8) for transfers of Yen 10,000 or more but less than Yen 30,000 (US\$ 281.7); and Yen 721 (US\$ 6.8) for transfers of Yen 30,000 or more.	Zengin Data Telecommunication System (Zengin) is an electronic domestic funds transfer system operated by the Tokyo Bankers Association.
	BOJ-NET	Participants pay variable charges to the Bank of Japan. The fees include (1993 figures): (a) Yen 40 (US\$ 0.4) for ordinary fund transfers and Yen 60 (US\$ 0.6) for third party fund transfers. Participants also pay fixed charges for linkages with the BOJ-NET centre. Participants set fees for third-party transfers for their customers.	Bank of Japan Financial Network System (BOJ-NET) transfers funds among financial institutions electronically and is managed by the central bank.

Source: Bank for International Settlements (1993) Payment systems in the group of ten countries; European Monetary Institute (1996) Payment systems in the European Union; EMEAP (1997) Financial markets and payment systems in EMEAP economies.

United States

4.4. Cost and price studies on the U.S. banking system have been mainly focused on U.S. Federal Reserve payment services. This can be partly explained by the non-concentrated nature of the U.S. banking industry and the large number of banks located throughout the country. As for the data on commercial bank payment charges that partly reflect underlying costs, surveys have largely been conducted by private consulting firms. Traditionally, U.S. banks have provided payment services at little or no charge, using float earned on idle demand balances to cover these expenses (Humphrey *et al.*, 1999a).

4.5. However, following the Monetary Control Act of 1980, U.S. banks were required to raise their minimum balance requirements, leading to the charging of fees for payment services provided to deposit-taking institutions, including, for example, cheque collection, ACH, Fedwire, and net settlement services (Humphrey, 1984). The MCA also specified that the Federal Reserve was to set fees in such a way that revenues would recover the costs of providing payment services over the long run. The Federal Reserve was also required to include in its cost calculations, which basically involve actual operating expenses, a private sector adjustment factor (PSAF) which is a set of estimates of taxes and costs of capital it would incur if it were a private firm. Despite efforts to increase efficiency in the payments system, the U.S. banking system has not realized the cost-saving benefits from electronic payments (Humphrey *et al.*, 1999b). Part of the reason for this lies in the use of cost-based pricing for business but not for consumer purposes, as the latter group prefers to hold a minimum balance instead of paying for per transaction charges. Table 4.3 summarizes the commercial bank charges in the United States.

Table 4.3: U.S. Commercial Bank Fees, 1981 (US\$)

	Average	Low	High
Cash (per \$1,000 furnished)	0.42	0.03	0.75
Cheques (per encoded item)	0.04	0.012	0.12
ACH (per item plus per tape)	0.046 (item) 19.15 (tape)	0.01 (item) 10.00 (tape)	0.10 (item) 20.00 (tape)
Wire (regular transfer)	5.21	0.80	10.00

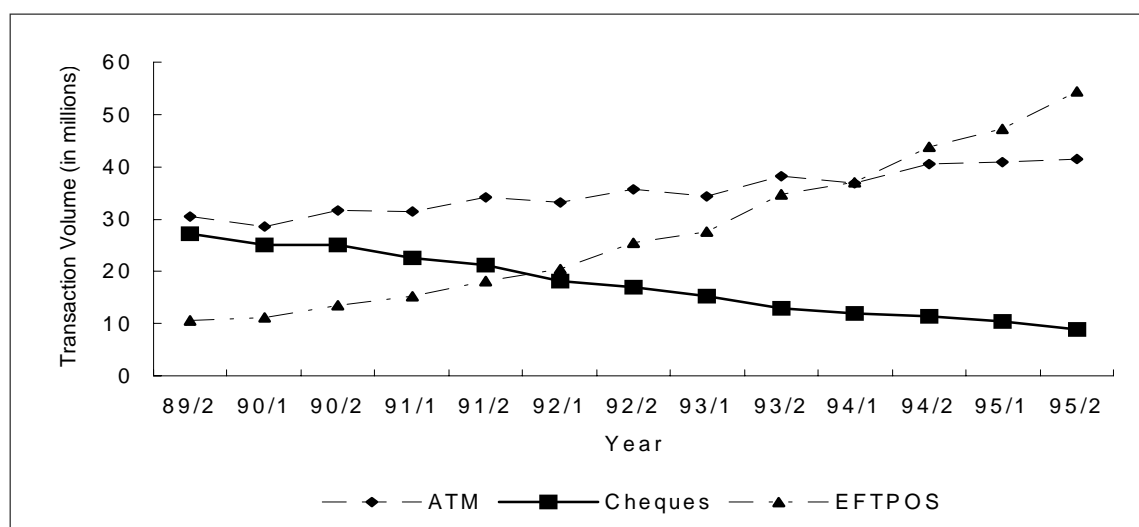
Source: Humphrey (1984, p.20). Data are based on a survey of 151 banks by Robert Knight Associates.

Norway

4.6. Norway conducted studies into the income, cost and price of payment services in the late-1980s and mid-1990s (Robinson and Flatraaker, 1995; Flatraaker and Robinson, 1995). On the international front, Norges Bank can be viewed as one of the fewest central banks in the world to have conducted a systematic study of costs and prices over a long period of time. Pricing in Norway has been implemented by banks individually and supported by the central bank. In terms of implementation, large banks were the first movers towards explicit pricing, which was followed by the smaller financial institutions. As a result, in a matter of six years from 1989 to 1995, Norway moved from having 90 percent of its transactions paper based, to having 60 percent in the electronic form (Humphrey *et al.*, 1999a). Reduction in the “cost to society” was

estimated at nearly 1 percent of GDP per year. During this period, the number of electronic transactions rose sharply as compared to paper-based instruments, which experienced a drop of 67 percent within six years, as shown in Figure 4.1. As a result, while transaction prices recovered only 20 percent of the variable cost in 1989, this increased to around 60 percent by 1995. Cheque usage dropped three-fold from 27 million to 9 million cheques between 1989 and 1996. EFTPOS transactions were over 5 times the amount of cheques written and even outnumbered ATM withdrawals.

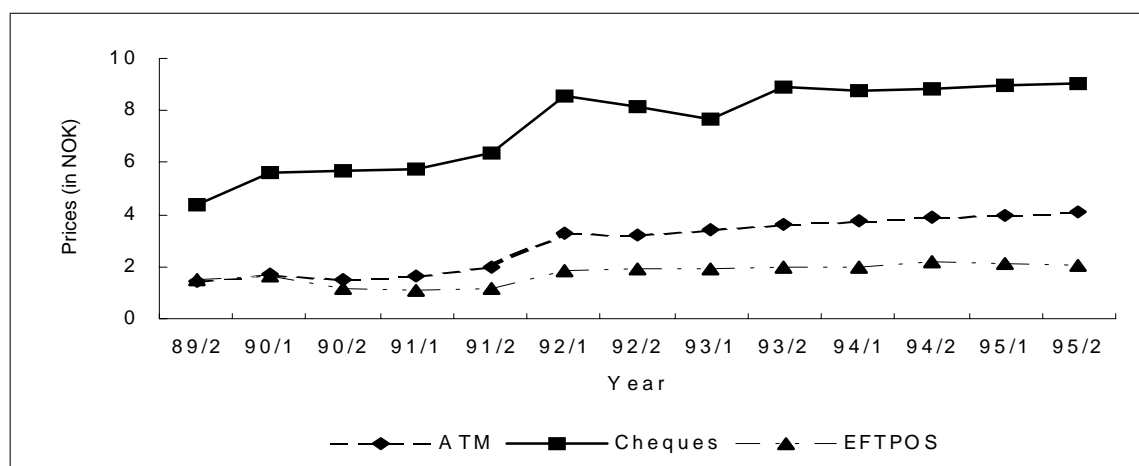
Figure 4.1: Cheque, ATM and EFTPOS Transaction Volumes in Norway, 1989-1995



Source: Humphrey, *et al.*, 1999a

4.7. The volume changes in Figure 4.1 above can be explained by price levels and changes therein during the same period. Figure 4.2 shows that writing a cheque is twice as expensive as using an EFTPOS or an ATM withdrawal. Such a gap reflects the high production cost of cheques as compared to the use of electronic alternatives, which have the benefits of scale economies when transaction volume increases.

Figure 4.2: Cheque, ATM and EFTPOS Price Changes in Norway, 1989-1995



Source: Humphrey, *et al.*, 1999a

4.8. The Norwegian experience serves as a successful story with regard to price-induced migrations from paper-based to electronic-based payments. The Norges Bank made the following conclusion (Flatraaker and Robinson, 1995, pp. 329-331):

- First, transaction prices should be set higher than variable unit costs.
- Second, bank efficiency and costs should determine prices in the payment system.
- Third, cost-based prices may lead to cheaper banking services.
- Fourth, float is not suitable for covering costs in the payment system.
- Fifth, differences in prices between services should correspond to cost differentials.
- Sixth, free cash-based services make it difficult to switch to cost-based prices in the payment system.
- And finally, there is a close correlation between current account deposit rates for private customers and bank' costs arising from account administration.

Australia

4.9. Australia has been one of the most recent countries to show interest in the study of payment prices and cost. A key drive behind this initiative was the Australian Government's Financial System Inquiry (the Wallis Inquiry) of 1996. This mainly made recommendations "on the nature of the regulatory arrangements that will best ensure an efficient, responsive, competitive and flexible financial system consistent with financial stability". One of the key findings from the inquiry was the prevailing high cheque dependency that had led to high payment costs. Another key development was the establishment of a Payments System Board by the Reserve Bank of Australia in 1998 (see Box 4.1). This provided the regulatory regime for increasing efficiency and reducing risks in the payments system.

4.10. In the area of pricing, the Payments System Board initiated a joint study into interchange fees for debit and credit cards with the Australian Competition and Consumer Commission. A large part of the study seeks to identify the basis on which interchange fees are set and the role of costs. This mainly focuses on cost estimates for EFTPOS, ATM and credit card transactions.

4.11. To provide a snapshot of payment charges in Australia, a summary of transaction fees for selected payment services is illustrated in Table 4.4. It can be observed that while banks set up monthly and per transaction charges, they also provide free payment services for a pre-determined number of transactions. Furthermore, branch-based over-the-counter (OTC) transaction fees were higher than other alternatives, while the transaction charges for cheques were generally higher than electronic-based methods such as ATMs and EFTPOS. This suggests that commercial banks have sought to shift customers from using high cost OTC methods to more economical electronic alternatives.

Box 4.1: The Payments System Board: Australia

Background: The Payments System Board was established on July 1, 1998 in response to the Financial System Inquiry of 1996. This sought to acknowledge the importance of the payments system to financial stability and of the scope to reap significant gains in efficiency.

Board Members: Board members include central bank officials and representatives drawn from both the public and private sectors. The Governor of the RBA (Reserve Bank of Australia) is the chairman of the Board.

Roles: The Board seeks to improve the safety and stability of the payments system by reducing settlement, legal and operational risks and achieving efficiency gains.

Responsibilities and Powers: The Board's responsibilities and powers are set out in four separate Acts:

- The Reserve Bank Act of 1959,
- The Payment Systems (Regulation) Act of 1998,
- The Payment Systems and Netting Act of 1998, and
- The Cheques Act of 1986

Relationship with the Reserve Board and the Government: The Board is required to inform the Government of its policies. In the event of a difference of opinion between the Government and the Board, the provisions of the Reserve Bank Act of 1959 provide a mechanism for dispute resolution.

Relationship with the Australian Competition and Consumer Commission (ACCC): The RBA and ACCC are in close contact toward the approach to policies on access and competition in the payments system. The Governor of RBA and the Chairman of the ACCC also meet at least once a year to discuss issues of mutual interest in the payments system.

Source: Annual Report of the Payment Systems Board, Reserve Bank of Australia

Table 4.4: Transaction Fees of Australian Banks - August 1999

	ANZ	COLONIAL STATE	COMMON WEALTH	NATIONAL AUSTRALIA	ST. GEORGE	WESTPAC
	<i>Access Flexible Option</i>	<i>State Basic Account</i>	<i>Streamline Account</i>	<i>National Flexi Account</i>	<i>Everyday Account</i>	<i>Classic Account</i>
No. of free transactions	8 ¹	5	5 ¹	8 ²	8	8
Account-keeping fee (per month)	\$6.00	-	\$3.00	\$4.00	\$5.00	\$5.00
OTC withdrawal	2.50	2.00	2.00	2.00	2.00	2.00
Cheque	0.65	N/A	0.60	1.00	0.50	0.65
EFTPOS	0.40	0.50	0.40	0.50	0.50	0.65
ATM withdrawal						
- Own bank	0.65	0.50	0.60	0.50	0.50	0.65
- Other bank	1.50	1.50	1.25	1.25	1.50	1.25
Telephone transaction	0.40	0.50	0.40	-	0.20	0.65
Bill payments	0.40	0.50	0.40	0.30	0.20	0.65

Source: Annual Report of the Payments System Board, Reserve Bank of Australia, 1999, p. 16

Notes: ¹Maximum of 2 over-the-counter; ²Maximum of 4 over-the-counter; N/A not applicable

United Kingdom

4.12. In March 2000, *Competition in UK Banking* was published in response to the Chancellor of the Exchequer's 1998 pre-Budget report (Cruickshank, 2000). The report

investigated the level of competition and innovation in three major markets, namely, money transmission, services to personal customers and services to small- and medium-sized businesses. The money transmission market deals specifically with payment systems.

4.13. In areas related to pricing, the study found that the money transmission market was characterized by inefficiency and unregulated networks which were dominated by large banks. Moreover, such institutions play major decision-making roles in associations or establishments related to payment services. These include the British Bankers' Association, the Association of Payment Clearers (APACS), the Joint Money Laundering Steering Group, and the operations of the Banking Ombudsman Scheme.

4.14. As a result, this created a market structure with discriminatory access to money transmission, barriers to efficiency and innovation, barriers to switching suppliers, information problems, and an inflexible payment system that was slow in adapting to fast-moving developments in electronic commerce. In other words, payment schemes were largely restricted to banks. The report suggested that such market failures required sustained market intervention. The key recommendation involved the establishment of a Payment Systems Commission or Pay Com.

4.15. Pay Com will act as a licensing authority for current and potential providers of payment services. The location of this new licensing regime will be independent of the competitive authorities, other regulatory commissions, and of the industry. In addition to having legal powers, it will introduce five licensing conditions, namely, price transparency, good governance, non-discriminatory access, efficient wholesale pricing and fair trading.

Key Lessons

4.16. Several lessons can be learned from the international experience. First, regulatory regimes must be put in place to support pricing policies. In the United States, Fed payment services were guided by the Monetary Control Act of 1980. This changed the role of the central bank from a 'free' provider of payment services to that of competitor and pushed payment costs previously absorbed by the central bank on to the industry. As for Australia, the newly established Payment Systems Board was backed by regulations that empowered the Board and the Reserve Bank to gather information from a payment system or individual participants and to set payment policy, respectively. A more recent development is the recommendation emerging from a comprehensive banking review in the United Kingdom to establish the Pay Com. This legal entity would serve to issue licences to payment service providers and promote more competition in the payments market.

4.17. Second, transparent and cost-based pricing must be supported. In Norway, the introduction by banks of charges for payment transfers since the mid-1980s has led to the expansion of direct pricing, which considers costs, to a broader range of payment services. During the same period of time, Finnish banks gradually moved towards full-cost pricing after providing free or under-priced (subsidized) payment services in the era of interest rate controls. In response to wide public opposition against such charges, banks introduced service packages, some of which were free of charge, for domestic

payment pricing which satisfied the needs of different customer groups, particularly the retired and the younger segments. More recently in Australia, the Reserve Bank has supported moves towards more appropriate and transparent pricing of payment transactions, thus adopting a policy of explicit charging for the banking services it provides. Such a policy also considers costs when setting payment charges. Similarly, price transparency was suggested as a key condition for obtaining a payment service license from the proposed Pay Com in the United Kingdom.

4.18. Third, paper-based payments should be charged higher than electronic alternatives. Price data from Norway and Australia tend to suggest that once electronic payments systems started to substitute their paper-based counterparts, this would lead to considerable cost-savings to banks and the economy as a whole. In fact, such pricing practices encourage payment participants to use the most economical payment method, while discouraging the use of other means that are more expensive in terms of production cost. Thus, the use of cheques in Norway has become twice as expensive as the use of electronic methods like ATM withdrawals or EFTPOS. In Australia too, the price of the former has been slightly higher than the latter instruments.

Box 4.2: International Studies on Payment Costs

At the international level, multilateral institutions have also given increased attention to the study of payment costs. Some of the earliest international studies were conducted by the Organisation for Economic Co-operation and Development (Revell, 1983; 1980). Although the OECD studies were mainly concerned with general bank costs and the implications of electronic funds transfer, they raised the issue of electronic payment services becoming more network-based. Particularly noteworthy is the appropriateness of applying the marginal cost pricing method, as computer resources may not have been used for a specific payment service but instead for many bank services. Elsewhere, the World Bank has also published a policy paper on the cost recovery and pricing of payment services (Humphrey, *et al.*, 1997). In addition, the Bank for International Settlements has noted the efficient use of resources as being one public policy objective in the core principles for systemically important payment systems that should be pursued by monetary authorities (Bank for International Settlements, 2000a, p. 4; 8-9).

At the national level, few central banks have carried out comprehensive studies on payment cost. Most notable has been Norway. The Norges Bank has looked into the income, costs and pricing of commercial bank and post office payment services (Flatraaker and Robinson, 1995; Robinson, and Flatraaker, 1995). Although being perhaps the only country to have made considerable progress in this area, its central bank has taken a proactive view, suggesting further research into "risk-adjusted real-cost" pricing, which will be a method that charges for risks in different types of payment services (Bank for International Settlements, 2000b, p. 14). The United States has also carried out a large number of cost studies but this has been primarily based on Federal Reserve payment services (Humphrey *et al.*, 1999; Humphrey, 1984; 1982). The unconcentrated nature of the U.S. banking system has been one reason that explains the difficulty behind such a research. The U.S. based Bank Administration Institute has also developed an ATM Cost Model. The model, which is based on fully weighted and incremental cost concepts, was aimed to be used by all financial institutions in the United States, regardless of the asset size, the scope of their ATM program, or any other differentiating criteria (van der Velde and Vargo, 1982, p. 2). Australia, through the Reserve Bank of Australia's Payments System Board and the Australian Competition and Consumer Commission, started a study in early-1999 in response to the Financial System Inquiry of 1996 on the interchange fees of debit and credit card schemes.

4.19. Finally, past academic and industry studies suggest that pricing to promote cost-saving means of payments would involve co-operation from both the central bank and commercial banks in tracking costs and having them reflected in the appropriate payment charges (See Box 4.2). Basically, commercial banks should set their prices on a 'first approximation' of costs. Prices are first established at a low level which clearly does not fully cover costs. Initial prices are higher, possibly twice as high, for paper-based payment services and lower for electronic services. Costly charges to bank accounting systems should not be mandated nor even strongly recommended at the start. Alternatively, the central bank can help gather cost information and offer this to commercial banks and to the public for justifying payment pricing. Cost information can serve as a guideline to commercial banks as they make their pricing decisions, starting with low prices, which are raised over time. And all banks should undertake to price payment services at the same time and at the same level.

Where Thailand Stands

4.20. It is interesting and educative to compare the fee and cost figures obtained for this study to the international data. Table 4.5 reports three payment means—electronic fund transfer for large-value and for small- to medium-value transactions and cheques—for Thailand, Norway, and the United Kingdom.

4.21. To make the comparisons meaningful, the Norwegian and the U.K. data are adjusted by not only the exchange rates but also the differences in the prices of inputs used to complete the payments. The inputs are classified as labor and non-labor, whose cost ratios are derived from the cost figures obtained from the BOT second cost survey.

4.22. When compared with Norwegian fees, the electronic means of payments in Thailand appear to be much more expensive. The fees for Norwegian equivalent of Media Clearing (the Remittance/Terminal Giro) was only 3.25 baht compared to 10 baht in Thailand. The same is true for direct debit and direct credit. Cheque prices in Thailand, on the other hand, are much lower; in Norway, they were as high as around 20 baht in 1998.

4.23. When compared with the U.K. costs, the average costs of cheque processing and Media Clearing in Thailand were higher. Although part of the differences could be attributed to the difference in volume, it may not rule out inefficiency in Thai payment systems as one of the causes.

4.24. The cost of large-value electronic fund transfer (BAHTNET for Thailand and CHIPS for the U.K.), on the other hand, was higher in the U.K. This might be because the average total cost is used for the U.K. CHAPS but average variable cost is used for the BAHTNET. Also, the sharp devaluation of baht since 1997 could also explain this difference.

Table 4.5: Comparison of Payment Prices and Costs in Thailand and Selected Countries

	EFT (large value)	EFT (small to medium value)			CHEQUES	
<u>Thailand (fee & cost data)</u>	BAHTNET 3 rd Party	Media Clearing	Direct Credit	Direct Debit	Personal CHQ	Corporate CHQ
Volume (1998, thousand)	243	1,397	15,708	15,286	48,825	2,570
Labor Cost/Total Variable Cost	47%	35%	51%	38%	43%	43%
Fees in Baht (1998)	250	10	10	10	2	2
Cost in Baht (AVC)	67.5	7.6	3.7	2.2	15.5	15.5
<u>Norway (fee data)</u>		Remittance/ Terminal Giro	Remittance/ Terminal Giro	Agreement- based Giro	Personal CHQ	Business CHQ
Volume (1998, thousand)		129,300		26,300	9,400	
Fees in Kroener (1998)		1.45	1.45	1.6	10.72	10.46
Exchange Rate (1998)		5.47	5.47	5.47	5.47	5.47
Fees in Baht (unadjusted)		7.9	7.9	8.8	58.6	57.2
Fees in Baht (adjusted)		3.25	2.53	3.18	20.2	19.7
<u>U.K.(unit cost data)</u>	CHAPs	BACS		BACS	Cheque	Cheque
Volume (1998, thousand)	18,000	(41 millions/peak days)			(around 28 billions)	
Cost in Pound (1994)	8.2	0.2		0.2	0.44	0.44
Exchange Rate (1998)	68.37	68.37		68.37	68.37	68.37
Cost in Baht (unadjusted)	560.6	13.7		13.7	30.1	30.1
Cost in Baht (adjusted)	186.20	5.11		4.97	10.4	10.4

Assumptions: 1. Norway and U.K. Labor Cost is 7 times higher than Thai Labor Cost

2. Norway and U.K. Other Variable Cost is twice that of Thailand

Notes: Assumption (1) is calculated by comparing the salary of an average Norwegian professional clerk working in the finance industry, which was equal to 19,600 Kroener/month (107,212 baht/month), while his/her Thai counterpart is assumed to earn 15,000 baht/month.

AVC: Average Variable Cost

Chapter 5

Price Recommendations

Payment Pricing and Regulations

5.1. To start a meaningful discussion on the pricing principle, it may first be necessary to ask whether or not the pricing of payment services needs regulation.

5.2. Up until now, the Bank of Thailand has followed a mixed practice of control and relative freedom when regulating payment pricing. On the one hand, it has been implicit that changes to payment fees, especially fees on traditional means of payment such as cheques, must be endorsed by the BOT. Fees on BOT-initiated electronic means such as Media Clearing were directly set by the BOT. On the other hand, there are some fees for which commercial banks enjoy relatively more freedom in setting prices and other conditions; for example, ATM, debit cards, credit cards.

5.3. On theoretical grounds, market-determined pricing will lead not only to efficiency but also to ‘safety’ (i.e., pricing that includes risk premium) in most markets. However, some preconditions are necessary for market-determined pricing to function properly. These include, a competitive market structure, full and freely flowing information, and the absence of all externalities (technological and market externalities).

5.4. The competitive nature of Thai commercial banks falls at best in a gray area. Judging from its concentration ratio (for example, the ratio of assets of the three largest banks to the total assets of the industry) and the sheer number of banks, the banking industry is probably some distance away from full competition. The occasional practice of joint decisions on some important business matters, including those related to payment systems, through the bank associations could also raise doubts in the minds of independent observers about the level of competitiveness of the industry.

5.5. The financial crisis of 1997 might have significantly changed the structure of the Thai banking industry. With the entry of foreign banks into almost all Thai banks, whether in terms of takeovers of some small banks, or increasing ownership in some medium-sized banks, the competition in the banking industry can be expected to rise significantly. The flexibility of interest rate adjustments witnessed in the past few years could be regarded as one of the positive signs.

5.6. As for payment pricing, the finding of this study that fees of some electronic payments exceed costs should not be seen as directly pointing to a possible collusion among banks. As argued in Chapter 3, banks may merely want to compensate for their subsidization of cheques. When all banks follow this strategy, their pricing of electronic means of payment could appear similar regardless of any possible collusion.

5.7. The consideration of the banking industry structure alone does not, therefore, overwhelmingly favor regulation. This does not, however, mean that payment pricing

should be free of regulation at once. This study recommends that the liberalization of the payments industry be implemented gradually. Some strategies for promoting market price determination should be devised and their outcomes followed closely. Only after the market performs satisfactorily in term of pricing, the regulations should be lifted.

5.8. There is also another reason favoring regulation. It is well known that the end-user's choice of a payment product is influenced by 'network externality'—a particular payment service is chosen simply because most other end-users also use that service. The popularity of cheques can also be explained partly by this network externality. The presence of the network externality renders market-determined pricing inefficient in the sense that the market fails to move toward a more efficient but less accepted means of payment. Interference into the market is thus warranted.

Pricing Principles

5.9. The next question is, then, what kind of regulation scheme is most desirable? Because of the principal objective of making price recommendations that promote the use of electronic means of payment, this study takes the stance that the regulations should provide incentives to the service providers in developing and promoting electronic payments.

5.10. For the above reason, the regulation scheme of choice is 'Price Cap' regulation. Under this regulation scheme, ceilings are set on all regulated payment products. The service providers are prohibited from charging fees higher than these ceilings or caps, but are allowed to enjoy abnormal profits for a predetermined time period if they have advanced their technologies to achieve lower costs.

5.11. The price cap regulation consists of four principal elements:

- Initial price ceilings
- Inflation rate or projected inflation rate to adjust the price caps accordingly.
- An adjustment factor, called 'X factor', to adjust price caps downward by taking into account the advancement in industry-related technologies.
- A predetermined time period, called a 'regulatory lag', during which the price caps are reviewed and possibly reset.

5.12. The other advantage of price cap regulation over the other popular regulation scheme, viz., the rate-of-return regulation, is that unlike the latter, it does not endorse inefficiency. In the rate-of-return regulation, prices are set in excess of costs equaling a target rate of return. If a regulated firm or industry is operating with inefficiency, which exhibits in unjustifiably high cost, the rate of return pricing will protect this inefficiency. It also requires, regular and timely cost information for periodical adjustment of the regulated prices.

5.13. In contrast, the price cap regulation scheme does not require information on costs on a regular basis. It does, however, need a starting price structure to form a set of price ceilings. For this, the study decides to use the present cost data from the BOT second cost survey that have been adjusted downward to come as close as possible to the cost

structure that does not encompass inefficiency (see Chapter 3 for the details on cost figure adjustment).

5.14. The initial price ceilings are derived from the cost figures using the marginal cost pricing (MC) concept as a starting basis. However, because the calculation of marginal costs is not possible without a reliable series of cost data from identical production functions, the study adopts the concept of average variable cost pricing (AVC) as the practical alternative to the marginal costs.

5.15. A general guideline from the international experiences (Chapter 4) will also be considered. This is to complement the suggestions derived from the cost figures. As already seen from Chapter 4, the fee structure in countries that have been more successful in inducing migration away from paper-based to electronic-based payment means (e.g., Norway), is the one in which the fees for electronic payment products are at the most half of the fees on paper-based instruments. That fee structure could serve as the ultimate goal for the Thai payment fee structure. The speed with which the actual fee structure can move toward that ultimate goal is discussed in the next section.

Additional Considerations on Initial Price Caps

5.16. Although the MC, or AVC, has a strong theoretical background as a pricing principle for achieving efficiency, there are, however, some other considerations that would make the desirable pricing deviate from the MC.

5.17. The other considerations that influence the price recommendations of this study are the following:

- Perfect or near-perfect or even close-to-near-perfect electronic substitutes to cheques have not been developed. As a result, cheque fee hikes, as implied by the AVC pricing, might not induce significant migration away from using cheques.
- If cheque fees could not be increased due to the above limitation, reducing electronic payment fees would increase the overall subsidization to the payment systems. Either the commercial banks or the BOT must therefore bear the cost of fee restructuring.
- Additional mark-up to AVC pricing may be necessary for electronic payment products which are introduced later and which involve substantial investment (e.g., BAHTNET).

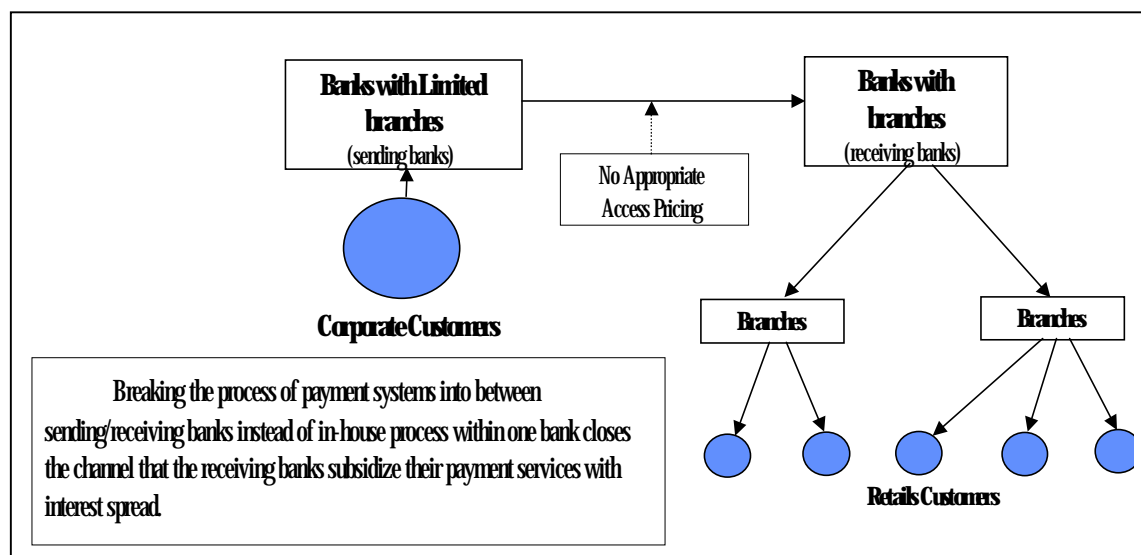
5.18. Another important consideration is the existence of conflicts between large banks with extended branch networks and small or foreign banks with no or limited numbers of branches. The conflicts are exhibited in two payment systems, Media Clearing and BAHTNET.

5.19. Commercial banks that have an extensive branch network claim that some payment systems provided by the Bank of Thailand are used for neutralizing the disadvantages of single-unit banks. Single-unit banks can provide complete services to their customers by using the branch networks of large commercial banks, without having to invest in a branch network themselves. Consequently, large banks feel that fee share

allocation between the sending and the receiving banks was not fair to them. There are clear evidences in the Media Clearing system that foreign banks aggressively participate in the system as major sending banks.

5.20. The conflict can be better viewed as a problem related to the access of branch networks. The situation is depicted in Figure 5.1.

Figure 5.1 Conflict over Branch Network Access via Payment Transactions



5.30. Note that it is not uncommon for one service provider to get access to the network owned by another service provider. Long-distance telephone companies need access to customers serviced by local telephone companies. The accessing service provider usually pays an “access price” to the network owner. The pricing of access rights is often a central issue in many industries.

5.31. Two things are, however, uncommon in the current situation of the Thai payment systems. First, both the accessing banks and the network owner banks essentially provide the same set of services to their customers. Second, there is no access pricing incorporated in the current fee structure imposed by the Bank of Thailand. For these two reasons, the current fee allocations on Media Clearing and BAHTNET between single-unit sending banks and multi-branch receiving banks are indeed inappropriate.

5.32. The need to address the issue of access pricing will therefore influence the price recommendations below.

Full-Cost Recovery Pricing

5.33. The simplest and straightforward pricing would be the full-cost recovery pricing. Under this scenario, the price will be set such that the total revenues from direct fees and float income equal the total variable cost.

5.34. The constraint that total income, fees and float, equals total variable cost can be implemented with or without cross-subsidization between payment products. A price

structure that does not permit cross-subsidization will have the price of each payment system equalling its respective average variable cost (AVC).

5.35. For no cross-subsidization full-cost recovery pricing, the fees are set as follows:

$$\begin{aligned} \text{BOT Fees} &= \text{BOT Average Variable Cost (BOT AVC)} \\ \text{End-User Fees} &= \text{Commercial Bank AVC} + \text{BOT AVC} - \text{Average Float Income} \end{aligned}$$

5.36. Although the proposed fees will be the price caps for the year 2000 or beyond, the 1998 figures of commercial banks' AVC from the BOT cost surveys will be used without any adjustment for inflation. There are two reasons for this: (a) the inflation rates after 1998 have been very marginal and (b) the restructuring of workforce within all commercial banks should have prevented the average variable costs from rising, if not caused them to fall.

5.37. The BOT's 1998 average variable cost figures, however, need adjustments, because they are not good approximates of the marginal costs. As pointed out in Chapter 3, the BOT can facilitate much higher transaction volumes of BAHTNET, ECS, and Media Clearing without having to recruit more people. And since the variable cost figures for BOT (see Table 3.4) comprise solely the labor costs, the implied marginal costs are essentially zero for the three payment products.

5.38. The BOT's zero marginal costs will not stretch over the entire volume scale. If the volumes of BAHTNET, ECS or Media Clearing are adequately large, larger personnel will be needed. The total variable cost curve therefore behaves more like a step function. This feature of AVC complicates the setting of the initial price caps that best approximate the marginal cost concept.

5.39. In order to find a compromise on the issue, this study takes the actual average variable cost that is determined by the actual, or estimated, volumes over the year the price cap regulation is to become effective. This way, the use of zero marginal costs, which are not accurate in the long run, can be avoided, while at the same time the step function nature of the total variable cost is taken into account.

5.40. Assuming that the price cap regulation begins in 2000, the volumes of transaction for the period 2000-2001 are required. These can be estimated using an econometric forecast model of each payment service¹, as shown in Table 5.1.

5.41. The volumes for July 2000 to June 2001 are then used in the calculation of the BOT average variable costs for BAHTNET, Media Clearing and ECS, which are then added to the AVCs from the commercial banks to arrive at the end-user fees. For the other payment products, the 1998 AVCs from the BOT and the commercial banks are directly totaled.

¹ The model uses monthly data for the period from February 1997 to April 2000. The explanatory variables used in the model include the economic activity level in the non-agriculture sectors, the dummy for tax paying time, a dummy variable for financial crisis in 1997, a dummy variable for changes in BAHTNET transaction requirement in March 2000, and linear and quadratic time trends.

Table 5.1: Actual and Forecasted Transaction Volumes (1997-June 2001)

Payment Products	1997	1998	1999	2000 Jan-Jun	2000 Jul-Dec	2001 Jan-Jun
BAHTNET interbank Transfer	40,964	55,919	58,693	53,320	63,203	64,614
BAHTNET 3 rd party Transfer	137,139	187,208	196,495	178,507	211,594	216,317
Media Clearing (thousand)	261	1,397	2,790	1,923	2,422	2,936
Direct Credit (thousand)		15,708	16,644	9,445	9,713	9,999
Direct Debit (thousand)		15,286	16,197	9,191	9,451	9,731
ECS (thousand)	65,166	53,773	54,419	27,646	30,613	31,292
BOT Cheques	29,500	29,285	27,390	6,415	2,637	2,636
Provincial Fund Transfer	110,820	103,116	96,419	45,177	43,015	40,870

5.42. Among the five BOT-owned payment products, only Media Clearing generates float income. The float income is exclusive to the sending banks, because the sending banks generally debit their customers' accounts two days before the actual media clearing takes place at the Bank of Thailand. Applying the current savings deposit interest rate of around 3 percent per year to the average transaction value of 28,000 baht for Media Clearing in 1999, the float income for two days' balance is about 4.5 baht per transaction.

5.43. The full-cost recovery fee structure based on all the above calculations is presented in Table 5.2.

Table 5.2: Fee Caps Structure: Full Variable Cost Recovery

Payment Product	End-User to Commercial Bank Fee		Commercial Bank to Bank of Thailand Fee	
	Current Fee	Proposed Fee	Current Fee	Proposed Fee
BAHTNET Interbank Funds Transfer	-	-	10	20
BAHTNET 3rd Party Funds Transfer	250	90	12	20
Sending bank	150	60	12	20
Receiving bank	100	30	-	-
Media Clearing	10.0	5.5	0.6	2.0
Sending bank	4.1	2.0	0.6	2.0
Receiving bank	5.9	3.5	-	-
Personal & Corporate Cheques	5.0	16.0	1.2	0.8
Collecting bank	-	4.0	0.2	-
Paying bank ¹	5.0	12.0	1.0	0.8
BOT Cheques ²	-	-	-	100
Provincial Fund Transfer	-	-	60	250

Note: ¹The paying bank's fee on cheques includes 3 baht of stamp duty.

²The proposed BOT cheque fee is applicable to commercial banks only. Government agencies are not required to pay the fee

5.44. Under the full variable cost recovery principle, the fee structure would be dramatically altered against paper-based and traditional means of payment. Personal and corporate cheques will be priced at 16 baht per cheque (3 baht stamp duty included), of which 12 baht will be allocated to the paying bank and 4 baht to the collecting banks. BOT cheques and the provincial fund transfer service by the BOT will also see sharp fee hikes, from zero to 100 baht and 60 baht to 250 baht, respectively.

5.45. BAHTNET third party fund transfer fees, on the other hand, will be reduced substantially, from 250 baht to 90 baht, of which 20 baht is the fee commercial banks pay to the BOT. This is because the average variable cost incurring to commercial

banks is only 67 baht. The 90 baht fee will be divided between the sending bank (60 baht) and the receiving bank (30 baht).

5.46. The total fee for Media Clearing will also be reduced from 10 baht to 5.5 baht per transaction. Both the sending and the receiving banks will get lower fees, but for different reasons. The receiving bank's fee of 3.5 baht is taken from its AVC. The sending bank's fee is calculated from its AVC of 4.5 baht minus the float income, which is also 4.5 baht, to which adds the BOT fee of 2 baht.

5.47. As indicated earlier, although applying the full-cost recovery principle to the initial price caps structure has theoretical attractiveness, other considerations and practicality may not make it the most appropriate fee structure. The following points can be made against the full-cost recovery fee structure.

- Drastic changes in the fee structure, particularly a sharp increase of cheque fees will certainly face strong resistance from end-users.
- Substantial cheque fee hikes should only be implemented when there are close electronic substitutes. That is not the case at present.
- The option of allowing BAHTNET fees to recover only the variable costs may be difficult to gain acceptance from commercial banks that would argue that their fixed investments in BAHTNET infrastructure were substantial and should not be completely ignored.
- The allocation of fees between the sending and receiving banks under BAHTNET and Media Clearing does not take into account the access pricing issue, discussed earlier.

Recommended Fee Structure

5.48. The recommended fee structure takes the full-cost recovery fee structure as the starting point and makes amendments according to the considerations mentioned above.

5.49. The rationales for the recommended fee structure are the following:

- For efficiency gain, the fee structure should move toward the AVC structure. Electronic payment fees, both the end-user fees and the BOT fees, are reduced and cheque fees increased.
- A gradual change in cheque fee should be adopted, i.e., only a small increase of one baht is recommended for the initial price caps structure. Moreover, the cheque fee hike should be limited to personal and corporate cheques processed with ECS, which is mostly confined to cheques within BMA. It is assumed that cheque users in the BMA are more likely to find the electronic near-substitutes to cheques (while some of those living in provincial areas might revert to using cash if cheque fees were increased). Further, cheque fee hike is only recommended with the development and wider use of electronic substitutes.
- The receiving banks for BAHTNET and Media Clearing should be able to negotiate with the sending banks the access price of their branch network.

- Allowance should be made for some of the fixed cost investment in the BAHTNET third party fund transfer fees.

5.50. Table 5.3 displays the recommended fee structure. Unlike in the full-cost recovery fee structure, the BOT fees are determined with a (short-term) strict marginal cost pricing for BAHTNET and Media Clearing, making the BOT fees for these two services zeros. The rationale is that since recovering cost is not the prime concern here, it is better to use marginal costs especially when it is possible to review and adjust these fees at the end of the regulatory lag. The exception is the ECS sorting and settlement fees, which remain the same as the current fees. This is necessary in order to be consistent with the objective of this study, namely, to discourage the use of paper-based payments.

Table 5.3: Recommended Fee Caps

Payment Product	End-User to Commercial Bank Fee		Commercial Bank to Bank of Thailand Fee	
	Current	Proposed	Current	Proposed
BAHTNET Interbank Funds Transfer	-	-	10	-
BAHTNET 3 rd Party Funds Transfer	250	100	12	-
Sending bank	150	Negotiate	12	-
Receiving bank	100	Negotiate	-	-
Media Clearing	10.0	8	0.6	-
Sending bank	3.5	Negotiate	0.6	-
Receiving bank	5.9	Negotiate	-	-
Personal & Corporate Cheque (ECS)	5.0	6.0	1.2	1.2
Collecting bank	-	-	0.2	-
Paying bank ¹	5.0	6.0	1.0	1.2
BOT Cheques ²	-	-	-	15
Provincial Fund Transfer	-	-	60	60

Note: ¹ Paying bank's fee on cheques includes the 3 baht stamp duty.

² The proposed BOT cheque fee is applicable to commercial banks only. Government agencies are not required to pay any fee.

5.51. The commercial banks' net fee (end-user fees minus BOT fees) for Media Clearing is higher than those suggested by the full cost recovery. These follow the rationale laid out above that the receiving bank should be able to negotiate access price with the sending bank for allowing the latter access to the branch network of the former. The total fee needs to be higher than the total variable cost because it does not include the cost of running branches.

5.52. The BAHTNET net fees are also higher than the full-cost recovery fees, partly because of creating the room for access pricing negotiation as in the case for Media Clearing, and also because of the allowance for the part of fixed investment cost in BAHTNET borne by commercial banks.

5.53. Restricting cheque fee hikes to those cheques processed through ECS has one additional advantage. It will increase the incentive for banks outside the BMA area to join the ECS, which would benefit the end-users en route in term of quicker settlement.

5.54. The issue of access pricing for using the receiving bank's branch network is also indirectly addressed—domestic banks with larger branch networks tend to issue more cheques than banks with a limited number of branches or none at all.

5.55. The BOT fee on provincial fund transfer is kept at 60 baht per transaction, in spite of the very high cost of this instrument, simply because as yet there is no alternative to it.

Financial Implications to Commercial Banks and the Bank of Thailand

5.56. It is the goal of this study that the recommended fee structure is acceptable to both the service providers (commercial banks) and the end-users. To evaluate the acceptability to commercial banks, the study attempted to estimate the financial implications of the recommended fees.

5.57. The calculations are based on two sets of forecasted volumes, as presented in Table 5.1: the one-year-ahead volume for July 2000 to June 2001, and the five-year-ahead volumes up to the year 2005. The two sets of volumes are used to reflect the situation in the short-term and the medium-term, respectively. Since the forecasts are all based on non-price factors, the forecasted volumes will be affected by changes in end-user fees. The response to price changes is determined by price elasticity for each payment product. Unfortunately, estimating price elasticities is not possible because the fees have been regulated and have not changed during the period for which the data are available. Therefore, the price elasticities are adopted with adjustments from a study on Norwegian payments products. The assumed elasticities are also presented in Table 5.4 along with the forecasted volumes for each payment product.

Table 5.4: Forecasted Volumes and Assumed Price Elasticities

Payment Product	Short Term (July/2000-June/2001)		Medium Term (2005)	
	Volumes	Elasticity	Volume	Elasticity
BAHTNET interbank Transfer	127,818	-0.10	144,141	-0.30
BAHENET 3 rd party Transfer	427,911	-0.30	482,558	-0.90
Media Clearing	5,358,250	-0.50	21,521,500	-1.50
Direct Credit	19,712,091	-	23,531,733	-
Direct Debit	19,181,968	-	22,898,887	-
Personal and Corporate Cheques (within ECS)	58,809,285	-0.20	88,614,663	-0.30
BOT Cheques	5,272	-0.50	140,134	-1.50
Provincial Fund Transfer	83,885	-0.50	45,604	-1.50

Source: Volumes are obtained from an econometric forecast model. Elasticities are assumed.

5.58. The elasticities in the medium term, during which the end-users will have more time to respond to price changes, are assumed to be three times as high as those in the short-term. The exception is cheques (ECS), for which the elasticity is assumed to be – 0.3 for the medium-term compared to –0.2 for the short-term.

5.59. The BAHTNET interbank fund transfer is assumed to have a low elasticity of –0.1 because the transactions in BAHTNET are usually high value transactions for which security is probably a greater concern than prices. Also, since most of the interbank transactions that used to be done through cheques have already been moved into BAHTNET, there is unlikely to be any sharp change in a monthly BAHTNET volume from that in March 2000. For personal and corporate cheques within the BMA, the elasticity is also assumed to be relatively low because there are still no close substitutes.

5.60. The elasticities for direct credit and direct debit are not present in Table 5.4 because they are assumed to be substitutable by Media Clearing. Their volumes are hence determined by the forecasted volumes of Media Clearing and the total market for the three products, which is assumed to grow by 10 percent each year.

5.61. The calculations of financial implications for commercial banks are as follows. For each payment product, let P and Q denote, respectively, the current fee and volume of the base forecast and P* and Q* denote the new fee and volume following the end-user response to fee changes. Also, let C denote the average variable cost. Then,

$$\begin{aligned}
 \text{Financial Differences} &= \text{Profit/Loss (new fees)} - \text{Profit/Loss (current fees)} \\
 &= [P^*Q^* - CQ^*] - [PQ - CQ] \\
 &= [P^* - P]Q + P^*Q^* - P^*Q - C[Q^* - Q] \\
 &= [P^* - P]Q + [P^* - C][Q^* - Q] \\
 &= \text{Direct Price Effect} + \text{Migration Effect}
 \end{aligned}$$

5.62. The above equation applies to the Bank of Thailand's financial differences as well, but with the additional constraint that the total variable costs for BAHTNET and Media Clearing are unaffected by their volumes, indicating zero marginal costs.

5.63. Direct price effects are the direct revenue changes resulting from price changes without influence on volume. Migration effects are caused by the changes in volume in response to price changes, calculated at the new margin P*-C. The signs of the direct price effects are the same as the signs of price changes, i.e., they are negative when prices decrease and positive when prices increase. The sign of the migration effect depends on two factors: change in volume due to price change (in the opposite direction of price change) and whether commercial banks make profit or loss at the new prices. For example, an increase in cheque fees, which induces a decrease in its volume will benefit commercial banks not only because of the increased revenue from fee rise but also because of reduced losses from fewer cheque transactions which were earlier subsidized.

5.64. Table 5.5 summarizes the short term financial implications of the recommended fee structure for both commercial banks and the Bank of Thailand. It shows that, for commercial banks, the benefit from increased cheque fee more than offsets the effects of lower fees on BAHTNET and Media Clearing, improving the financial position of the commercial banks by as much as 67 million baht per year. The Bank of Thailand, on the other hand, will see its subsidization of the BOT-owned payment systems increased by 12.3 million baht, due mainly to the abolition of fees on BAHTNET and Media Clearing and also due to the reduced use of cheques.

5.65. It should be noted that the implication that commercial banks are likely to gain from the recommended fee structure is robust to the degree of accuracy of the cost figures. Assuming that the (high and) unadjusted cost figures are truly accurate, the migration effect will correspond to a larger gain on cheques and large losses for BAHTNET and Media Clearing, with the net migration effect likely to still be positive². Commercial banks would be worse off only with the following conditions happening at the same time: cheque price elasticity is very low; BAHTNET and Media Clearing price

² With the same reasoning, the financial implication will be robust to the use of average total cost rather than average variable cost.

elasticities are much higher than assumed; and that banks will be making a large loss per transaction with the recommended fees on BAHTNET and Media Clearing. It is unlikely that all of these conditions will occur simultaneously.

Table 5.5: Short Term Financial Implications of Recommended Fee Structure (based on forecasted volume for July 2000-July 2001, million baht)

	Direct Price Effect		Migration Effect		Total Effect	
	CBs	BOT	CBs	BOT	CBs	BOT
Fees–Total Cost under current fees					-1,339.2	-98.8
Fees–Variable Cost under current fees					-570.6	4.8
Profits/Losses due to Fee Changes¹	34.9	-9.5	30.5	-2.8	65.3	-12.3
BAHTNET Interbank Fund Transfer	1.3	-1.3	-0.6	0.0	0.6	-1.3
BAHTNET 3 rd Party Fund Transfer	-17.6	-5.1	2.5	0.0	-15.1	-5.1
Media Clearing	-7.5	-3.2	0.2	0.0	-7.3	-3.2
Direct Credit	0.0	0.0	-1.7	0.0	-1.7	0.0
Direct Debit	0.0	0.0	-2.0	0.0	-2.0	0.0
Personal & Corporate Cheques (ECS)	58.8	0.0	32.1	-2.8	91.0	-2.8
BOT cheques	-0.1	0.1	0.0	-0.0	0.0	0.1
Provincial Fund Transfer	0.0	0.0	0.0	0.0	0.0	0.0

Source: Authors' calculations

Note: ¹ The additional profits/losses are calculated based on the average variable cost for each product.

5.66. Commercial banks are likely to be better off over the medium term as well, as shown in Table 5.6. The financial improvement from the recommended fee structure is lower than over the short term, though, because the volume of electronic-based payments (BAHTNET and Media Clearing) increases much faster over time than cheques, without any price changes. Hence, over the medium term commercial banks stand to lose income and profits with the recommended fees compared to what they would get under the current fee structure.

Table 5.6: Medium Term Financial Implications of Recommended Fee Structure for Commercial Banks (based on forecasted volumes in 2005; million baht)

	Direct Price Effect	Migration Effect	Total Effect
Fees–Total Cost under current fees			-2,133.9
Fees–Variable Cost under current fees			-931.8
Profits/Losses due to Fee Changes¹	-8.8	38.4	29.7
BAHTNET Interbank Fund Transfer	1.4	-2.2	-0.7
BAHTNET 3 rd Party Fund Transfer	-66.6	8.5	-58.1
Media Clearing	-30.1	2.3	-27.9
Direct Credit	0.0	-20.5	-20.5
Direct Debit	0.0	-24.7	-24.7
Personal & Corporate Cheques (ECS)	88.6	72.7	161.3
BOT cheques	-2.1	2.4	0.3
Provincial Fund Transfer	0.0	0.0	0.0

Source: Authors' calculations

Note: ¹ The additional profits/losses are calculated based on the average variable cost for each product.

5.67. For the end-users, the lower subsidization level of the overall payments system as shown in Table 5.5 and 5.6 necessarily means a higher burden. However, the indirect

benefit is tremendous because lower fees on electronic payments will induce more use of these instruments, which also offer non-pecuniary benefits such as timeliness, accuracy, and security. Moreover, if and when the volume of electronic means of payment reaches a 'critical mass', the positive network effects so prevalent and important in any payment system will start to capitalize and bring even greater benefit to the end-users.

Access Pricing Negotiation

5.68. The study proposes that the allocation of fees between the sending and the receiving banks for BAHTNET third party fund transfer and Media Clearing be no longer determined by the Bank of Thailand.

5.69. In the current fee structure the BOT sets ceilings on the fees charged by the sending banks and the fees receivable by the receiving banks. For example, the sending bank in Media Clearing cannot charge its customers more than 10 baht per transaction, of which the receiving bank cannot claim more than 5.9 baht, leaving the maximum of 3.5 baht for the sending bank (after deducting the BOT fee of 0.6 baht). In reality, all receiving banks request the 5.9 baht maximum but the sending banks often offer their customers discount taken from their 3.5 baht fee, partly because they enjoy float income from Media Clearing, and partly because they view this service as one channel to serve their (corporate) customers using the branch network of the receiving banks.

5.70. Naturally, the receiving banks contend that this practice is unfair as their branch network is used by the sending banks without proper compensation.

5.71. One way to address the branch network access conflict is to raise the receiving banks' fee ceiling. However, there are two drawbacks: first, the value of each receiving bank's branch network is different due to differences in network size and branch distribution. Second, if the ceiling were to be set so as to cover all possible values of branch network, it would be rather high, and would create an opportunity for some receiving banks (with a low value network) to charge unjustifiably high access prices.

5.72. The study therefore proposes that fee caps are set on the total fees for BAHTNET and Media Clearing and that the fee sharing be determined through bilateral negotiations between the sending and the receiving banks. Sending banks that are willing to charge low fees on their part can pass the higher fee portion to the receiving banks. The receiving banks will thus have more incentive to accept the transactions.

5.73. The fee allocation can vary between different pairs of sending/receiving banks. For instance, receiving banks' fees may vary with the size of the branch network. Banks with larger branch networks tend to have higher value, but may also have lower average cost due to economy of scale.

5.74. One possible difficulty in implementing this recommendation is that commercial banks may be unable to reach agreement in their negotiations, or the negotiations may take too much time. This has happened in some of the past negotiations between banks. To facilitate prompt and fruitful negotiations, the study proposes the following rules on the negotiations.

- The two parties in the bilateral negotiations must reach an agreement within one month from the BOT-announced date on which the new fee structure becomes effective.
- Either party can withdraw from the negotiations.
- If an agreement cannot be reached within one month, the two parties will be allowed to charge separate compulsory fees the total of which is lower than the total fee ceiling for the payment product involved in the negotiation. The compulsory fees are to be determined by the BOT.
- The compulsory fees will be in effect until the two parties notify the BOT that an agreement has been reached.

5.75. The proposed negotiation scheme will provide incentives for the banks to negotiate, because both parties stand to lose if there is no agreement. Also, the scheme should prevent either party from demanding an unfair share of the fees because the other party can withdraw from the negotiation, leaving both banks including the demanding bank only the compulsory fees.

5.76. An additional merit of allowing commercial banks to negotiate on fees is to prepare the market for the Bank of Thailand's ultimate goal of letting the market determine the payment system fees.

Alternative Fee Structures

5.77. For the demonstration purpose, the study offers two alternative fee structures to the recommended one. These two alternatives have their own rationale and merits, which will be compared with the recommended fee structure.

Fee Caps Structure: Alternative I

5.78. One of the considerations that the study uses to form the recommended fee structure instead of the full-cost recovery is that many cheque users do not have true electronic substitutes to the cheque. Although the recommended fee structure advises only a small increase in the cheque fee out of this concern, it might be interesting to consider the option that cheque fees are frozen altogether. This is the rationale for the first alternative, as shown in Table 5.7.

5.79. Under this alternative, the cheque fee remains unchanged at 5 baht per cheque, while the fees for other means of payment are the same as proposed in the recommended fee structure. The burden of fee restructuring to reduce electronic payment fees is borne by both commercial banks and the Bank of Thailand, with more weight placed on commercial banks. Tables 5.8 and 5.9 present the short term and medium term financial implications of this alternative.

Table 5.7: Alternative Fee Caps Structure I

Payment Product	End-User to Commercial Bank Fee		Commercial Bank to Bank of Thailand Fee	
	Current	Proposed	Current	Proposed
BAHTNET Interbank Funds Transfer	-	-	10	-
BAHTNET 3 rd Party Funds Transfer	250	100	12	-
Sending bank	150	Negotiate	12	-
Receiving bank	100	Negotiate	-	-
Media Clearing	10.0	8	0.6	-
Sending bank	3.5	Negotiate	0.6	-
Receiving bank	5.9	Negotiate	-	-
All Cheques	5.0	5.0	1.2	1.2
Collecting bank	-	-	0.2	0.2
Paying bank ¹	5.0	5.0	1.0	1.0
BOT Cheques ²	-	-	-	15
Provincial Fund Transfer	-	-	60	60

Note: ¹ Paying bank's fee on cheques includes the 3 baht stamp duty.

² The proposed BOT cheque fee is applicable to commercial banks only. Government agencies are not required to pay the fee

Table 5.8: Short Term Financial Implications of Alternative Fee Structure I (based on forecasted volume for July 2000-July 2001; million baht)

	Direct Price Effect		Migration Effect		Total Effect	
	CBs	BOT	CBs	BOT	CBs	BOT
Fees–Total Cost under current fees					-1,339.2	-98.8
Fees–Variable Cost under current fees					-570.6	4.8
Profits/Losses due to Fee Changes¹	-23.9	-9.5	-1.7	0.0	-25.6	-9.6
BAHTNET Interbank Fund Transfer	1.3	-1.3	-0.6	0.00	0.6	-1.3
BAHTNET 3 rd Party Fund Transfer	-17.6	-5.1	2.5	0.00	-15.1	-5.1
Media Clearing	-7.5	-3.2	0.2	0.00	-7.3	-3.2
Direct Credit	0.0	0.0	-1.7	0.00	-1.7	0.0
Direct Debit	0.0	0.0	-2.0	0.00	-2.0	0.0
All cheques	0.0	0.0	0.0	0.00	0.0	0.0
BOT cheques	-0.1	0.1	0.0	-0.03	0.0	0.1
Provincial Fund Transfer	0.0	0.0	0.0	0.00	0.0	0.0

Source: Authors' calculations

Note: ¹ The additional profits/losses are calculated based on the average variable cost for each product.

5.80. This alternative will certainly not be well accepted by commercial banks. But more importantly, it contradicts with the principles set out in the study, namely, that the overall subsidization of the payment systems should be reduced, and that paper-based means of payment should be gradually discouraged.

5.81. Moreover, although this alternative addresses the branch network access issue with the negotiation of fee allocations on BAHTNET third party fund transfer and Media Clearing as in the recommended fee structure, it lacks the indirect solution through increased cheque fee.

Table 5.9: Medium Term Financial Implications of Alternative Fee Structure I for Commercial Banks (based on forecasted volumes in 2005; million baht)

	Direct Price Effect	Migration Effect	Total Effect
Fees–Total Cost under current fees			-2,133.9
Fees–Variable Cost under current fees			-931.8
Profits/Losses due to Fee Changes¹	-97.4	-34.2	-131.6
BAHTNET Interbank Fund Transfer	1.4	-2.2	-0.7
BAHTNET 3 rd Party Fund Transfer	-66.6	8.5	-58.1
Media Clearing	-30.1	2.3	-27.9
Direct Credit	0.0	-20.5	-20.5
Direct Debit	0.0	-24.7	-24.7
All Cheques	0.0	0.0	0.0
BOT cheques	-2.1	2.4	0.3
Provincial Fund Transfer	0.0	0.0	0.0

Source: Authors' calculations

Note: ¹ The additional profits/losses are calculated based on the average variable cost for each product.

Alternative Fee Caps II

5.82. The second alternative, shown in Table 5.10, is similar to the first alternative in that the cheque fee is frozen, with the same rationale. The difference is that in this alternative the Bank of Thailand bears the entire cost of fee restructuring, by lowering the BOT fee on cheque sorting and settlement through ECS by one baht, the same amount that commercial banks would get from end-users through the cheque fee increase.

Table 5.10: Alternative Fees Caps II

Payment Product	End-User to Commercial Bank Fee		Commercial Bank to Bank of Thailand Fee	
	Current	Proposed	Current	Proposed
BAHTNET Interbank Funds Transfer	-	-	10	-
BAHTNET 3 rd Party Funds Transfer	250	100	12	-
Sending bank	150	Negotiate	12	-
Receiving bank	100	Negotiate	-	-
Media Clearing	10.0	8	0.6	-
Sending bank	3.5	Negotiate	0.6	-
Receiving bank	5.9	Negotiate	-	-
All Cheques	5.0	5.0	1.2	0.2
Collecting bank	-	-	0.2	-
Paying bank ¹	5.0	5.0	1.0	0.2
BOT Cheques ²	-	-	-	15
Provincial Fund Transfer	-	-	60	60

Note: ¹ Paying bank's fee on cheques includes the 3 baht stamp duty.

² The proposed BOT cheque fee is applicable to commercial banks only. Government agencies are not required to pay the fee

5.83. In essence, the Bank of Thailand would increase its subsidization for both the electronic and paper-based payment products (except the BOT cheques and provincial fund transfer) under this alternative. The only reason for suggesting this is to gain commercial banks' acceptance to the lowering of electronic payment fees.

5.84. As shown in Table 5.11, commercial banks will actually be better off with this alternative fee structure, but not by as much as they would under the recommended fee structure. The migration effect that works in favour of commercial banks under the recommended fee structure as people reduce their cheque use will not occur under this alternative, while the commercial banks still stand to lose some of their direct debit/credit business to the cheaper Media Clearing. The total effect is nevertheless an improved financial condition for commercial banks.

5.85. As in the recommended fee structure, commercial banks may still not prefer this alternative to the current fee structure over the medium term (Table 5.12), because they lose the opportunity to cash in on increased volumes of electronic payments under the current fee regime. Again, this should not be weighed against the social gains from the increased use of electronic payment products.

5.86. This second alternative fee structure shares the drawbacks of the first alternative fee structure. That is, it increases the overall level of subsidization in the payment systems. Moreover, the subsidization goes to the paper-based product (cheques) as well, thus going even further against the principles set out for this study.

5.87. It does not help that the subsidization comes from the Bank of Thailand. As pointed out in Chapter 4, the international standards require that the central bank sets the fees for its services the same way as the private sector would. While subsidization of electronic means of payment can be rationalized with the need to promote their use until a critical mass is reached, there is no good reason to support the subsidization of paper-based products.

Table 5.11: Short Term Financial Implications of Alternative Fee Structure II
(based on forecasted volume for July 2000-July 2001; million baht)

	Direct Price Effect		Migration Effect		Total Effect	
	CBs	BOT	CBs	BOT	CBs	BOT
Fees–Total Cost under current fees					-1,339.2	-98.8
Fees–Variable Cost under current fees					-570.6	4.8
Profits/Losses due to Fee Changes¹	30.2	-66.5	-1.7	0.0	28.5	-66.5
BAHTNET Interbank Fund Transfer	1.3	-1.3	-0.6	0.00	0.6	-1.3
BAHTNET 3 rd Party Fund Transfer	-17.6	-5.1	2.5	0.00	-15.1	-5.1
Media Clearing	-7.5	-3.2	0.2	0.00	-7.3	-3.2
Direct Credit	0.0	0.0	-1.7	0.00	-1.7	0.0
Direct Debit	0.0	0.0	-2.0	0.00	-2.0	0.0
All Cheques	54.1	-57.0	0.0	0.00	54.1	-57.0
BOT cheques	-0.1	0.1	0.0	-0.03	0.0	0.1
Provincial Fund Transfer	0.0	0.0	0.0	0.00	0.0	0.0

Source: Authors' Calculations

Note: ¹ The additional profits/losses are calculated based on the average variable cost for each product.

Table 5.12: Medium Term Financial Implications of Alternative Fee Structure II for Commercial Banks (based on forecasted volumes in 2005; million baht)

	Direct Price Effect	Migration Effect	Total Effect
Fees–Total Cost under current fees			-2,133.9
Fees–Variable Cost under current fees			-931.8
Profits/Losses due to Fee Changes¹	-15.9	-34.2	-50.1
BAHTNET Interbank Fund Transfer	1.4	-2.2	-0.7
BAHTNET 3 rd Party Fund Transfer	-66.6	8.5	-58.1
Media Clearing	-30.1	2.3	-27.9
Direct Credit	0.0	-20.5	-20.5
Direct Debit	0.0	-24.7	-24.7
All Cheques	81.5	0.0	81.5
BOT cheques	-2.1	2.4	0.3
Provincial Fund Transfer	0.0	0.0	0.0

Source: Authors' calculations

Note: ¹ The additional profits/losses are calculated based on the average variable cost for each product.

Chapter 6

Other Recommendations

6.1. The price recommendations in the previous chapter are aimed at changing the behavior of the payment systems end-users. The changed relative fees between the two electronic-based payment services, the BAHTNET and the Media Clearing, and the paper-based instruments, viz., personal and corporate cheques, favouring the former should induce migration toward a greater use of the electronic-based products. Such migrations due to price changes have been evident in countries that have been more aggressive in cost recovery pricing, for example, Norway (Humphrey *et al.*, 1999; see also Chapter 4).

6.2. But price, or fee, is not the only determinant of which payment service remains or dominates the system. Other factors are also important, including the level of economic development, average per capita income and income distribution, the levels of general and payment-specific technology, payment market structure, laws, etc. The differing and complex combinations of these and other factors explain the presence of a wide range of payment products, even among developed countries.

6.3. The BOT corporate end-user survey revealed that these non-price factors can perhaps be more important than price. Many end-users identified various non-price factors that deterred them from using electronic means of payment (see Chapter 2 for more details).

6.4. It is critical, therefore, to gain a better understanding of the influence of each of these non-price factors on the choice of payment service before the strategy for a truly successful migration toward electronic payments can be envisioned.

6.5. Because the objective of this study is to formulate the price recommendations proposed in the previous chapter, this report will not offer any detailed analyses that would lead to policy measures regarding the non-price factors. However, some key areas of importance that may need further action will be identified. These are as follows.

Laws and System Projection

6.6. Some end-users feel that the security in electronic payment is not adequate. This belief tends to be untrue technologically but may be justifiable with respect to the legal environment and institutional settings. In most cases, evidence of electronic funds transfer is not yet acceptable in legal procedures; current criminal laws may not be adequately comprehensive when applied to electronic payment frauds; the overall system may be unable to insure itself against damages caused by mistakes in the transmission of payment information.

6.7. The making or amendment of relevant laws is thus a necessary, and perhaps the most important, measure and a pre-requisite to encouraging wider use of electronic payment instruments. At present, the electronic signature bill is awaiting to be read and enacted by the parliament. Although it is difficult to gauge its impacts on the various electronic payment systems, the bill will certainly be a significant step forward.

6.8. A comprehensive arrangement is needed to address the complications arising from the irrecoverable nature of the electronic fund transfer. Potentially, this could be done with legal arrangements, but the payment service provider community (banks, non-bank institutions and the BOT) should work toward building a system that insures itself in this respect, and thus gains customers' confidence.

Electronic Substitutes to Cheques

6.9. Cheques are widely used for business-to-business transactions. This is true of not only corporate cheques but also personal cheques, used perhaps by most small- and medium-sized, incorporated and unincorporated, companies. Apart from their current low prices, cheques have several other advantages. For example, post-dated cheques are widely used in place of promissory notes to facilitate trade credits. In this instance, the ability to delay payments is a desirable feature not found in most electronic payment instruments which usually are attractive for timely payment.

6.10. The time cost of paying with cheques is low for many cheque users. Most payers and payees do not have to go to the bank themselves; instead, cheques can be collected, exchanged, and presented to the bank by any low-wage employee (unless they are 'cash' or bearer cheques).

6.11. Consequently, cheques will be used less only when there are electronic substitutes that possess the above and other advantages of cheques. There may be more than one electronic substitute, each with a different feature of the cheque. For example, a full-featured on-line banking will allow the payer or authorized persons to initiate payments from the comfort of the office or home, but it does not provide trade credits. Box 6.1 discusses some of the possibilities as far as substitutes to cheque payment are concerned.

Increasing the Electronic Contents of Cheque Processing

6.12. Another way to mitigate the problem of inefficient use of resource arising from cheque payments is to reduce the cost of settlement with cheques. The ECS developed by the Bank of Thailand represents such a step.

6.13. The investment in ECS has proved to be a sound investment, as has been shown by the cost figures in Chapter 3. The average variable cost of processing ECS by the BOT is low, indicating that if the process is not subject to 'increasing return to scale'—which is not very likely—then pricing at low marginal cost will make the investment profitable in the medium- or long-run, as well as benefiting cheque users.

Box 6.1: Payment Substitutes

For wholesale payments, which may involve large-value payments that are in the form of corporate cheques or fund transfers between government agencies, financial EDI has become a new and promising alternative payment method. A financial EDI system extends normal EFT functions in that the system allows trading partners to initiate payments directly from a computer without having to visit a bank. While a typical EDI system provides a computer-to-computer transfer of structured messages, particularly between business enterprises, financial EDI involves banks, acting as financial intermediaries, to transfer financial messages between trading partners. This has led to the setting up of value-added banks, particularly in North America.³ Nevertheless, such services have been marginal because of the wide use of EDI in the logistical areas of business transactions.⁴

Other innovative payment substitutes exist and have cost-saving potentials to both the provider and user of payments. This includes smart card schemes provided by commercial banks and non-bank players alike, electronic commerce payment services linked to the Internet, and 'cybermoney' whereby money takes a digital form, is placed in a special memory bank within a computer hard drive, and can be transferred to buy goods and services.⁵ In the last case, this has taken the form of 'e-cash', 'e-bills', 'e-coins' and 'e-cheque'. Such innovations have already taken place in the United States. For example, Citicorp Bank developed an Electronic Monetary System that supports digital bank notes that are electronically identifiable through tags.⁶ In another development, an 'e-check' program, which involved a consortium of commercial banks and computer companies, was piloted to facilitate the payment of cheques electronically.⁷

6.14. It is hence a sensible step forward that a feasibility study is initiated to find ways to further increase the electronic contents of cheque processing; for example, a reliable system that transfers electronic images of cheques, thereby reducing the need to transport cheques physically or to transport them less frequently.

6.15. Either the Bank of Thailand or the major banks that stand to benefit from such investments could lead the initiative. However, a thorough and careful evaluation of financial feasibility, especially if other electronic substitutes to cheques are also being developed, must be undertaken.

Increasing the Use of Information Technology in Payment Systems

6.16. Almost all payment products will gain from advancement and timely applications of information technology. The rapidly increasing availability and falling service prices of information and telecommunication technology will directly affect the cost structure of the payment systems both within and outside this study.

6.17. Among the advances in information technology that relate to the payment systems, on-line finance and e-commerce are likely to be the most significant applications to date.

6.18. It is important to be able to identify conditions or factors that might deter the use of information technology for payment systems. Obviously, lack of suitable laws and

³ Emmelhainz, M. A. (1993). *EDI: A Total Management Guide*. New York, Van Nostrand Reinhold.

⁴ O' Hanlon, J. (1993). *Financial EDI - Closing the Loop*. London, Banking Technology Limited.

⁵ Solomon (1997), *Virtual Money*, Oxford, Oxford University Press

⁶ See "Digitising dollars" (*The Economist* 30 March 1996, p. 90).

⁷ See "U.S. Treasury to inaugurate new system for paying checks over the Internet" (*Wall Street Journal Europe*, 30 June 1998, p. 9).

lack of enthusiastic coordination among banks discussed above are possible obstacles, but other factors remain to be identified.

Enhancing Competition in the Payment Service Industry

6.19. The level of competition in the Thai payments system market is at best a gray area. There is no known in-depth and reliable study that determines the overall competitive nature of the Thai banking industry, let alone describes industry practices in payment systems.

6.20. This is not surprising, since it is difficult to find a perfectly competitive industry that fits theoretical definitions. There are often areas where improvement toward more competition can be made. For payment systems in Thailand, the following measures may be desirable.

- *Price Transparency.* The BOT should regulate, and strictly enforce, commercial banks to publicly announce the current price caps on all of their payment services to all user groups.
- *Independent Fee Setting.* The fees for all payment systems should not be set collectively. Rather, banks should be encouraged to set fees independently, within the price caps initially, according to demand and supply of each payment product. This is an important step toward the liberalization of payment fees in the future.
- *Removal of Anti-Competition Laws and Regulations.* Some laws or regulations may prevent or discourage potential service providers from entering the market. They should be amended.
- *Fair Inter-Bank Payment Transactions.* Since inter-bank payments involve more than one bank, the terms of business between the banks must be fair. The branch network conflicts related to Media Clearing and BAHTNET are good examples of unfair arrangement. On the other hand, if banks are allowed to negotiate access prices, as recommended by this study, the network owners must not use the access pricing to foreclose the markets unfairly for these two payment products. Such a practice would restrict competition.

6.21. If deemed appropriate and timely, the BOT should conduct a thorough study of competition in the banking industry, especially those aspects related to policy and regulatory framework. The study should also be able to determine the interactions between competition and technological innovations.

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Appendix A

Survey Questionnaire on Corporate Customer

Part 1: General Information

1.1 Type of Business

Sole Ownership	Partnership	Company Limited
Public Company Limited	Other _____	

1.2 Business

Manufacturing	Wholesale	Retail
Import/Export	Service	Other _____

1.3 Scope of Operations (Please select one or more choices)

Bangkok and suburbs	Provincial	Inter-provincial
	Please indicate province _____	

1.4 Number of Employees

Below 9	10 - 100	101 - 500
501 - 1,000	Over 1,001	

1.5 Size of Total Assets

Below Baht 10 mil	Baht 10,000,001 – 100 mil	Baht 100,000,001 – 500 mil
Baht 500,000,001 – 1,000 mil	Over Baht 1,000,000,001	

1.6 What commercial bank payment services do you currently use? (Please select one or more choices)

Bangkok Bank	Krung Thai Bank	Bank of Ayudhya
Thai Farmers Bank	DBS Thai Dhanu	Thai Military Bank
Siam Commercial Bank	Siam City Bank	Bangkok Metropolitan Bank
Standard Chartered NakhornThon	Union Bank of Bangkok	Bank of Asia
Radhanasin	Chase Manhattan Bank	Sakura Bank
Citibank	Deutsche Bank	Standard Chartered
ABN AMRO NV	HSBC	Other _____

Part 2: Payment Usage Behavior

2.1 In the past month what type of payment services did your organization use?

<i>Payment Method</i>	No. of Transactions				<i>Never Used</i>	<i>Never used</i>
	<i>Below 20</i>	<i>Below 100</i>	<i>Below 1,000</i>	<i>Over 1,000</i>	<i>Unaware</i>	<i>Aware</i>
• Cheque						
• Direct debit for payment of goods and services to suppliers and manufacturers						
• Direct debit for interest or loan payments						
• Direct debit for utility payment						
• Direct credit for salary payment						
• Direct credit for dividend payment						
• BAHTNET						
• Other _____						
• Other _____						
• Other _____						

2.3 *Disregarding to payment charges, please indicate the changes below that will change your organisation from using cheques to electronic payment methods in the future.*

Type of Change	Willing to Change	Unwilling to Change
• Legal support		
• Electronic payment law		
• Daily bank statement		
• Weekly bank statement		
• Telephone banking		
• Facsimile banking		
• Transaction order by diskette		
• Bank transaction order on-line		
• Personal transaction order on-line		
• Price reductions in computer equipment		
• Price reductions in computer software		
• Price reduction for leased telephone line		
• Other _____		
• Other _____		
• Other _____		

Facts: (Please use this information to support questions 2.4 – 2.7) Currently, payment charges are Baht 5 per cheque, Baht 20 minimum charge for draft, and Baht 30 minimum charge for cashiers cheque

2.4 If cheque charges are increased to Baht 7, what fees for the following electronic payment services will you be willing to pay to shift from paper-based to electronic payment services?

<i>Type of Payment</i>	<i>Current Charges (Baht)</i>	<i>Suitable Charges (Baht)</i>
• Direct debit for payment of goods and services to suppliers and manufacturers	10 - 30/transaction	
• For transactions below Baht 100,000	-	_____
• For transactions over Baht 100,000	-	_____
• Direct debit for utility payment	5 - 20/transaction	_____
• Direct credit for salary or dividend payment	10 – 30/transaction	_____
• BAHTNET	Sender pays 150/transaction; Receiver pays 100/transaction; Incremental charges of 0.1% but below 750 for provincial transfers	_____
• Other _____	Please indicate the payment means you would like banks to provide or you currently use)	_____
• Other _____		_____
• Other _____		_____

2.5 If cheque charges are increased to Baht 10, what fees for the following electronic payment services will you be willing to pay to shift from paper-based to electronic payment services?

<i>Type of Payment</i>	<i>Current Charges (Baht)</i>	<i>Suitable Charges (Baht)</i>
• Direct debit for payment of goods and services to suppliers and manufacturers	10 - 30/transaction	
• For transactions below Baht 100,000	-	_____
• For transactions over Baht 100,000	-	_____
• Direct debit for utility payment	5 - 20/transaction	_____
• Direct credit for salary or dividend payment	10 – 30/transaction	_____
• BAHTNET	Sender pays 150/transaction; Receiver pays 100/transaction; Incremental charges of 0.1% but below 750 for provincial transfers	_____
• Other _____	Please indicate the payment means you would like banks to provide or you currently use)	_____
• Other _____		_____
• Other _____		_____

2.6 If cheque charges are increased to Baht 15, what fees for the following electronic payment services will you be willing to pay to shift from paper-based to electronic payment services?

<i>Type of Payment</i>	<i>Current Charges (Baht)</i>	<i>Suitable Charges (Baht)</i>
• Direct debit for payment of goods and services to suppliers and manufacturers	10 - 30/transaction	
• For transactions below Baht 100,000	-	_____
• For transactions over Baht 100,000	-	_____
• Direct debit for utility payment	5 - 20/transaction	_____
• Direct credit for salary or dividend payment	10 – 30/transaction	_____
• BAHTNET	Sender pays 150/transaction; Receiver pays 100/transaction; Incremental charges of 0.1% but below 750 for provincial transfers	_____
• Other _____	Please indicate the payment means you would like banks to provide or you currently use)	_____
• Other _____		_____
• Other _____		_____

Appendix B

Survey Questionnaire on Fees and Costs of Payment Services

1. OVERVIEW OF PAYMENT SERVICES

1.1 What payment services do your bank provide for customers? Please circle the relevant answers below.

(i) Cashiers cheque	(iv) Corporate cheque	(vii) BAHTNET (3 rd party)
(ii) Draft	(v) Direct debit	(viii) Media clearing
(iii) Personal cheque	(vi) Direct credit	(ix) Account-based money transfer

1.2 What payment services do your bank use for transferring funds? Please circle the relevant answers below.

(i) Cashiers cheque	(iii) Direct debit	(v) Media clearing
(ii) BOT Cheque	(iv) BAHTNET	(vi) Direct credit
(vii) Other		

1.3 What factors influence the fees you charge for payment services? Please rank each factor from 1 to 5 (1=very weak and 5=very strong).

Factors	Very Weak	Weak	Fairly Strong	Strong	Very Strong
(i) Revenue maximization	1	2	3	4	5
(ii) Profit maximization	1	2	3	4	5
(iii) Fees-based income maximization	1	2	3	4	5
(iv) Cost recovery	1	2	3	4	5
(v) Market leader	1	2	3	4	5
(vi) Customer services	1	2	3	4	5
(vii) Expand customer base	1	2	3	4	5
(viii) Corporate image	1	2	3	4	5
(ix) Social responsibility	1	2	3	4	5

1.4 Does your bank have a central place where the costs of payment services are determined and monitored? Please circle the relevant answer.

(i) yes	(ii) no
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1.5 Please indicate the unit within your bank that determines or manages payment cost?

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1.6 Does your bank use activity-based costing?

(i) yes	(ii) no (please indicate method) _____
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1.7 Which services below do you think are in conflict with commercial bank payment services? Please circle the relevant answers.

(i) ECS	(iii) BAHTNET	(v) Media clearing
(ii) BAHTNET (3 rd Party)	(iv) No competition	

1.8 In the next five years, whom do you prefer to be the operator of the services currently provided by the Bank of Thailand? Please circle the relevant answer for each service.

<i>Payment Service</i>	<i>Type of Ownership</i>		
	<i>BOT owned</i>	<i>Joint-ownership between BOT and commercial banks</i>	<i>Privatized</i>
BAHTNET	1	2	3
ECS	1	2	3
Media Clearing	1	2	3

2. PRICING INFORMATION

2.1 Please circle the general pricing method (s) that influences the setting of fees for your services? (See Notes, Box 1 for a further explanation of pricing methods.)

(i) Marginal cost pricing	(iv) Benefit flow pricing	(vii) Account-based pricing
(ii) Average cost pricing	(v) Peak-load pricing	(viii) Others _____
(iii) Two-part pricing	(vi) Par-value pricing	_____

2.2 Please provide annual volume and revenue data (including estimates if accurate data are unavailable) for 1998.

<i>Payment Service</i>	<i>Volume</i>	<i>Revenue (in Baht)</i>
Cashier cheque ^{1/}		
Draft ^{1/}		
Personal cheque ^{1/}		
Corporate cheque ^{1/}		
BOT cheque ^{1/}		
Direct debit ^{2/}		
Direct credit ^{2/}		
BAHTNET ^{2/}		
Media Clearing ^{3/}		
Account-based money transfer ^{2/}		

Notes: ^{1/} Number of items; ^{2/} Number of transactions sent; ^{3/} Number of transactions received

3. GENERAL COST DATA

3.1 Please provide the average cost per transaction for providing each type of payment service. If average cost is unavailable, please make an estimate.

<i>Payment Service</i>	<i>Average Cost per Transaction (Baht)</i>
Cashier cheque	
Draft	
Personal cheque	
Corporate cheque	
BOT cheque	
Bill of exchange/Promissory note	
Direct debit	
Direct credit	
BAHTNET	
Media Clearing	
Account-based money transfer	

Note: Average transaction cost includes average variable and fixed costs

3.2 Please indicate the total costs incurred by your bank in operating payment services in 1998. These costs should only relate to providing cheque, direct funds transfer, BAHTNET, Media Clearing, and account-based money transfer payment services (See Notes, Box 2 for details of cost components.)

<i>Cost Component</i>	<i>Operating Cost</i>
<u>Labour expenses:</u>	
Salaries	
Fringe benefits	
<u>Other expenses:</u>	
Supplies	
Utilities	
Transportation	
Other (please indicate)	

Total variable costs	
<u>Capital expenses:</u>	
Data processing	
Furniture	
Building occupancy	
Other (please indicate)	

Total fixed costs	
TOTAL COST	

5. NOTES

Box 1: Types of pricing methods

1. Marginal Cost Pricing. The extra cost of producing an additional payment is fully reflected in its price.
2. Two-Part Pricing. One price reflects the average fixed cost of providing the payment service while a second price reflects the averaged variable cost.
3. Benefit Flow Pricing. Two-part prices are split between payer and payee according to a judgment of how much each party gains from a transaction.
4. Peak-Load Pricing. Peak-load pricing cover the additional investment needed to build excess generating capacity used only when demand is at its peak.
5. Par-Value Pricing. Price is tied to the value of the payment being made rather than to the actual resource cost of making the transaction.
6. Account-Based Pricing. The costs of packages of account services - debit, credit and other account activities - are bundled into a single periodic payment.

Box 2: Details of cost components

Cost components should *include direct costs* incurred in operating the payment services. This *excludes indirect costs* such as general overhead (i.e. bank president's salary and administrative expenses) and opportunity costs.

1. Labour expenses may include salaries of staff such as (1) operators (2) officers (3) system administrators. Fringe benefits may include overtime, allowances, medical expenses, etc.
2. Other expenses may include stationary and transportation of payment media (i.e. magnetic disks, cheques) from one location to another, equipment insurance, servicing, security, etc.
3. Capital expenses. Data processing may include costs related to computer equipment (including taxes and import duties); application systems design, development, and testing; and management and other staff costs directly attributable to system set-up. Building occupancy may include costs related to site construction such as facilities, security equipment, telecommunication equipment (including taxes and import duties).

Appendix C

Cost Blueprints for the Second Cost Survey

BAHTNET Fund Transfer

Sending Bank		Receiving Bank	
I. Variable costs		I. Variable costs	
1	Data processing cost at HQ	1	Advice verification and key-in cost
	Transaction verification		
2	Data processing costs for BAHTNET		
	Key-in		
	Verify		
3	Continue papers		
II. Fixed costs		II. Fixed costs	
5	Depreciation of BAHTNET computer and computer host	2	BAHTNET processing cost
	Maintenance of BAHTNET computer and computer host		Depreciation of BAHTNET computer and computer host
6	Utilities		Maintenance of BAHTNET computer and computer host
7	Supplies	3	Utilities
8	BOT fees per month (divided by#trans)	4	Supplies
9	Leased telephone line	5	Leased telephone line
III. Total Cost		III Total costs	

BAHTNET Third Party Fund Transfer

Sending Bank		Receiving Bank	
I. Variable costs		I. Variable costs	
1	Data processing cost at branch	1	Advice verification
	Request form	2	Key-in
	Transaction verification		
	Posting		
2	Data processing costs at HQ		
	Transaction verification	II. Fixed costs	
3	BAHTNET processing cost	3	BAHTNET processing cost
	Key-in		Depreciation of BAHTNET computer and computer host
	Verify		Maintenance of BAHTNET computer and computer host
4	Cost of fund (under RTGS)	4	Utilities
		5	Supplies
		6	Leased telephone line
II. Fixed costs		<i>In the case of cash withdrawal at the receiving end:</i>	
5	Depreciation of BAHTNET computer and computer host	I. Variable costs	
	Maintenance of BAHTNET computer and computer host	1	Cash reserve
6	Utilities		Insurance
7	Supplies		Transportation
8	Continue papers		Personnel cost
9	BOT fees per month	2	Printing and paper cost
10	Leased telephone line	3	Cashing at branch
II. Total costs		II. Total costs	
III. Total costs (with Cost of Fund)		III. Total costs (with cash withdrawal cost)	

Media Clearing

Sending Bank		Paying Bank	
I. Variable costs		I. Variable costs	
1	Transaction processing cost	1	Posting
	Receipt of customer diskette and verification		Computer Operator
	Sorting costs	2	Continue papers
2	Continue papers	3	Customer service costs
II. Fixed costs		II. Fixed costs	
	Software cost		Software cost
	Depreciation of HQ computer		Depreciation of computer
	Depreciation of branch computer	4	Utilities
3	Supplies	5	Supplies
4	Transportation	6	Transportation
	Between branch and HQ	7	Payment media costs (Floppy disk, Cartridge tape, Reel tape)
	Between HQ and ECH		
5	Payment media costs (Floppy disk, Cartridge tape, Reel tape)		
		III. Total costs	
III. Total costs		III. Total costs (with cashing cost at branch)	

Direct Debit/Credit (Data preparation)

Direct Debit		Direct Credit	
I. Variable costs		I. Variable costs	
1	Transaction processing cost	1	Transaction processing cost
	Verification		Verification
2	Continue paper	2	Continue paper
II. Fixed costs		II. Fixed costs	
1	Supplies	1	Supplies
2	Utilities	2	Utilities
3	Payment media cost (diskette)	3	Payment media cost (diskette)
4	Transaction processing cost	4	Transaction processing cost
	Computer depreciation		Computer depreciation
III. Total costs		III. Total costs	

Direct Debit/Credit (Data Posting)

Direct Debit		Direct Credit	
I. variable costs (exclude cash reserve cost)		I. Variable costs (exclude cashing at branch, cash reserve)	
1	Continue paper	1	Continue paper
2	Posting	2	Posting
	Operator computer		Operator computer
	Processing cost	3	Cashing at branches
3	Cash reserve/delivery	4	Cash reserve/delivery
II. Fixed costs		II. fixed costs	
1	Supplies	1	Supplies
2	Utilities	2	Utilities
3	Payment media cost (diskette)	3	Payment media cost (diskette)
4	Posting	4	Posting
	Software cost		Software cost
	Depreciation of computer host		Depreciation of computer host
	Operator computer		
	IT		
III. Total		III. Total Cost	
IV. Total (include cash reserve)		IV. Total Cost (inc. Cash Reserve/delivery)	
IV. Total (include cash reserve)		V. Total Cost (inc. cashing at branches)	

Fund Settlement with Cheques (through ECS)

Collecting Bank		Paying Bank	
I. Variable costs		I. Variable costs	
1	Depositing over the counter	1	Verification cost
	Verification	2	Branch costs
	Posting		Reading/Sorting cost payable to ECH
2	Branch costs		Sorting cost
	Salary of reading/sorting personels	3	Central function costs
3	Central function costs		Printing costs and continue paper
	Printing costs and continue papers	II. Fixed cost	
	Cheque sorting cost	1	Cheque transportation costs
II. Fixed costs			Between branch and HQ
1	Branch costs		Between HQ and ECH
	Depreciation of reader/sorter	2	Central function costs
	Maintenance of computer and reader/sorter		Salary
2	Cheque transportation costs		Utilities
	Between branch and HQ		Supplies
	Between HQ and ECH		Booth rental cost
3	Central function costs		IT cost
	Salary		Maintenance of computer host at HQ
	Utilities		Maintenance of computer host at bran
	Supplies		Leased line
	Booth rental cost		Bank representative (at ECH)
	IT cost		Storage
	Maintenance of computer host/FEP at HQ		
	Leased line		
	Bank representative (at ECH)		
III. Total costs		III Total Cost	

Cheque Cost (personal cheque, draft, cashier cheque)

		Personal cheque	Draft	Cashier cheque
I. Variable costs				
1	Forms			
	Purchase request form			
	Cost of receipts			
2	Central Function costs			
	Data processing costs for on-line computer system			
	Printing costs			
	Continue papers			
	Encoding costs			
3	Additional printing on cashier cheques			
II. Fixed costs				
	Utilities			
	Supplies			
4	Central function costs (IT cost)			
	Depreciation of computer host and branch			
	Maintenance of computer host and branch			
III. Total costs				