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**Development of E-payments and Challenges for Central Banks:  
Thailand's Recent Experience**

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## EXECUTIVE SUMMARY

This country's paper deals with Thailand's recent experiences in the move towards greater use of e-payment products/services and the challenges for the Bank of Thailand (BOT) in striking the balance between "efficiency" and "safety" of the nation's payments system. It also provides a brief analysis regarding the implications of e-payments development on the central bank functions, especially those associated with the operation of monetary policy and the stability of the financial system.

Evidences suggest that e-payment development in Thailand has shown a promising development. As pointed out, every form of e-payment services operated by the BOT has shown a remarkably upward trend over the past decade, particularly those of the BAHTNET and SMART systems. Significant increase in the use of other e-payment channels offered by commercial banks and non-banks can also be seen for the cases of ORFT, credit/debit cards, payment channels related to the Internet and mobile phones. Evidences also show that Thailand still performed reasonably well when compared with some of the ASEAN countries.

Despite such a promising development, evidences obtained so far tend to suggest that the impact of e-payment on the operation of monetary policy and on the stability of the financial system has *not* yet produced any sort of serious concern on the part of the monetary authorities. This is partly because the relatively minimal size of the e-money transactions when compared with the money supply and the relatively low degree of currency substitution for e-payments. However, the monetary authorities may have to take into account the developments of certain types of e-payment products in the management of monetary policy in the period ahead, as they may complicate the Bank's operating procedure in setting interest rates. Among these include the issuance of e-money by non-bank private firms and the growing reliance on some close substitutes for cash in making payments like credit and debit cards.

Several policy decisions have been made by the BOT to encourage greater use of e-payment. Chief in this regard include: the use of pricing policy, the establishment of the New Payment Gateway Services of ITMX, the in-depth analysis of the payment choice by consumers and businesses, and the continued efforts to put in place new laws and regulations governing the e-payment business services, as reflected in the enactment of the "Electronic Transactions Act of 2001" and the recent proposal of the "Royal Decree Regulating E-payment Business".

Thailand's experiences have shown that the use of pricing policy alone may have not been aggressive enough in encouraging greater adoption of e-payment products. This is mainly because consumers and businesses tend to have given relatively higher weight to certain types of "non-price" factors in the process of making choice for using different types of payment instruments, particularly those related to the legal acceptance on e-receipt/e-document and the difficulties involved in the use of new e-payment products.

The paper concludes with the discussion about the factors affecting future direction of e-payments. Among these factors are: the BOT's strategic to advance e-payment, the BOT's strategic move towards the reduction of cash and check usage, the public's payment habits, the pace of changes in the country's legal and regulatory framework related to the payment system, and the challenges of creating net benefits for the use or the introduction of prospective e-payment products.

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# Development of E-payments and Challenges for Central Banks: Thailand's Recent Experience\*

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## Introduction

The use of electronic payments (e-payments) has spread rapidly in recent years thank to technological innovation and falling costs in computing and telecommunications. The spread of e-payment usage has been more varied across countries, due partly to differences among countries in factors such as the quality of the regulatory frameworks and the readiness of the telecommunications infrastructure. New payment services based on the Internet and mobile phones tend to have been increasingly offered in most advanced economies. The use of e-payments for making retail payments, including in particular Electronic Fund Transfer at Point-of-Sale (EFTPOS), E-banking, Telephone-banking Internet banking, E-debit, E-money, has become much more common in advanced countries with extensive network of telecommunication infrastructure. Nevertheless, the pace for such e-payment applications appears to be less clear in the case of some emerging economies.

As has been argued in many circles, Thailand's financial and infrastructure development has reached a point where e-commerce and e-payment systems are both technologically feasible and are required to remain globally competitive (Payment Systems Roadmap 2004, 2010). It has been increasingly agreed that there is an increasing need to respond to rapidly changing market conditions and to use newly developed technologies to enable both e-commerce in general, and e-payments in particular. Setting up the new e-payment gateway of the so-called Thailand national ITMX (Inter-bank Transaction Management and Exchange) in July 2005 represents a promising starting point in this regard. The establishment of ITMX has been viewed as a milestone development in the move toward the reaching of a more perfectly e-payment stage in this country, as it reflects a full recognition of the need to put in

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place a common infrastructure able to attract a critical mass of business using the newly created platform with high standard (Rungsun and Sayan, 2006).

Recent introduction of new payment fees, effective on 6 March 2006, has been seen as another good example in an attempt to use pricing policy to encourage a greater use of e-payment instruments rather than traditional forms of paper-based payment instruments such as paper cheques and cash. As discussed in more details later, fees on certain types of e-payment instruments/services have been adjusted downward at a relatively higher percentage when compared with those of paper-based payment instruments. The efforts by the Bank of Thailand (BOT) to foster changes in legal and regulation framework regarding e-payment can be seen as another good example in the move towards the growing reliance on e-payment initiatives for making retail payments by consumers and businesses. The enactment of the “Electronic Transactions Act of 2001” and the recent proposal of the “Royal Decree Regulating E-payment Business” can be seen as a good reflection for this.

While the growing use of e-payments may have raised the efficiency of electronic means of making payments and the overall country’s economic efficiency, such potential benefits may have to weight against treats posed by the increasing use of e-payments on the central banking functions. The treats, as has been claimed in many circles such as those reported in Banque De France (2001) and Arnone and Bandiera (2004), may be related to the impact of e-payment innovations on seigniorage, the effectiveness of monetary policy and overall integrity of the payment systems. The overall framework of monetary policy management, as it can be argued, appears to be affected by the recent surge in the use of e-money products. The challenges for central banks’ responsibility, therefore, are not only confined to the attainment of “efficiency” in the payment system, but also to the fulfillment of “stability” in the payment and financial systems. In view of this, central banks’ responsibilities are to ensure the fulfillment of both “efficiency” and “stability” in the payment system.

This paper deals with Thailand’s recent experiences in the move towards greater use of e-payment products/services and the challenges for the BOT in striking the balance between “efficiency” and “safety” of the nation’s payments system. In particular, we would like to share our experiences with respect to the implications of the development of e-payments on the core functions of the central banks as well as the use of diverse initiatives or strategies regarding e-payment. Although the main emphasis of the paper is given to Thailand’ case, some references to the case of certain SEACEN member countries will be made, where appropriate.<sup>1</sup>

Essentially, the paper will address the following issues:

- (1) The degree of development of e-payments in Thailand;
- (2) The relative importance of e-payments penetration in selected countries;

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<sup>1</sup> Central banks participating in the SEACEN research project are (i) National Bank of Cambodia, (ii) Bank Indonesia, (iii) The Bank of Korea, (iv) Bank Negara Malaysia, (v) The Bank of Mongolia, (vi) Nepal Rastra Bank, (vii) Bangko Sentral ng Pilipinas, (viii) Bank of Papua New Guinea, (viii) Central Bank of Republic of China, (x) Bank of Thailand, and (xi) State Bank of Vietnam.

- (3) Factors responsible for the promotion and/or obstacles of e-payment usage;
- (4) BOT strategy for supporting e-payment development;
- (5) Implications of e-payments development on the central bank functions;
- (6) Challenge for central bank in striking the balance between “efficiency” and “safety” of the nation’s payments system.

We start, in *Section 1*, with the overall review of the e-payment developments in Thailand<sup>2</sup>, with particular reference to e-payment systems operated by the BOT and the successful case of e-payment products in the form of ORFT (Online Retail Funds Transfer). It also highlights some certain aspects of e-payment developments in some SEACEN member countries. *Section 2* analyses the implications of e-payments development on the central bank core functions, especially those related to the operation of monetary policy, the integrity of payments system, and the stability of the financial system. It also discusses the strategies adopted by the BOT to help improve the effectiveness of risk management for e-payment products/services. *Section 3* provides detailed analysis of the use of diverse initiatives or strategies regarding e-payment, particularly those with respect to the use of pricing initiatives, the setting up of newly payment gateway service of ITMX, and the recent efforts to put in place new laws and regulations governing the e-payment business service. It also addresses some sort of factors that contribute to the promotion of e-payments as well as obstacles that tend to hamper future progress of e-payment innovations. We conclude, in *Section 4*, with a brief discussion of the expected challenges and problems, as well as the medium and long term plans regarding e-payments.

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<sup>2</sup> Conceptually speaking, the term “e-payments” refers to “large-value payments” and “small-value payments” or retail payments. However, following the agreement reached during the first workshop in August 2007 in Kuala Lumpur, the emphasis of the analysis in this paper is therefore given to “retail payments”. Loosely speaking, “retail payments” are referred to most of the non-cash payments made by consumers and businesses, including in particular cheques, credit/debit cards, direct credit/debit, Internet bill payment, and new types of e-payment mechanisms such as e-money (e-purse). It follows that, in the Thai context, this excludes large-value payments such as those made through BAHTNET.

## **I. Overview of E-Payment Developments in Thailand**

This section will first provide an overall review of the current status of E-payment penetration in Thailand. With the risk of oversimplification, the term e-payments used here are defined to include (1) e-money, (2) other innovative payment procedures, and (3) electronic access to traditional payment instruments. It is worth noting in this connection that cross-country comparison should be interpreted with great care, as the definition of the e-money tends to vary greatly from country to country.<sup>3</sup> For more details of this, see, for example, Fullenkamp and Nsouli (2004).

### **1.1 Existing E-payment Services Operated by BOT**

Like in many other countries, payment systems in Thailand have undergone significant changes for over two decades. Significant changes in this regard include the move toward the increasing reliance on the use of newly developed technologies to enable both e-commerce and e-payments. On the part of the BOT, it has over the last decade introduced the e-payment systems as the basis for financial transactions and financial settlements.

As one can see from Figure 1, the current e-payment systems in Thailand can be broadly grouped into two main categories: (i) core e-payment systems and (ii) other e-payment products. Basically, the core e-payment systems refer to the systems operating by the BOT. This partly reflects that the BOT has major role as a service provider. The systems include, for instance, BAHTNET (**B**ank of Thailand **A**utomated **H**igh-value **T**ransfer **N**etwork), SMART (**S**ystem for **M**anaging **A**utomated **R**etail **F**unds **T**ransfer), and ECS (**E**lectronic **C**heque **C**learing **S**ystem). For other e-payment products, they refer to the systems operating by the private sector, including Credit/debit cards, Direct Credit/Debit, ORFT (**O**nline **R**etail **F**unds **T**ransfer), Internet banking, Telephone banking, and Mobile banking.

As is commonly known, The BAHTNET system is primarily designed to handle a large-value electronic funds transfer system (inter-bank, Third Party) with RTGS transactions. The natures and main features of this system are in large part similar to those systems of RENTAS, MEPS, BI-RTGS, and CBC-CIFS currently operated in Malaysia, Singapore, Indonesia, and Taiwan, to name but a few. For more detailed description and analysis related to BAHTNET system, interesting readers are advised to read the following documents: (i) Sayan Pariwat and Rungsun Hataiseree (2004), (ii) Sayan Pariwat and Rungsun Hataiseree (2003) and (iii) Sayan Pariwat and Rungsun Hataiseree (2002).

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<sup>3</sup> In the case of Indonesia, for instance, ATM cards which are used for the purpose of cash withdrawal, not for payments for the purchase of goods and services, are often viewed as a type of e-payments. Likewise, all of the transaction volume and value associated with this sort of ATM cards are incorporated into the definition of e-payment usage for Indonesia's case. Practice of this kind seems to be not the case for some SEACEN member countries such as Malaysia and Thailand.



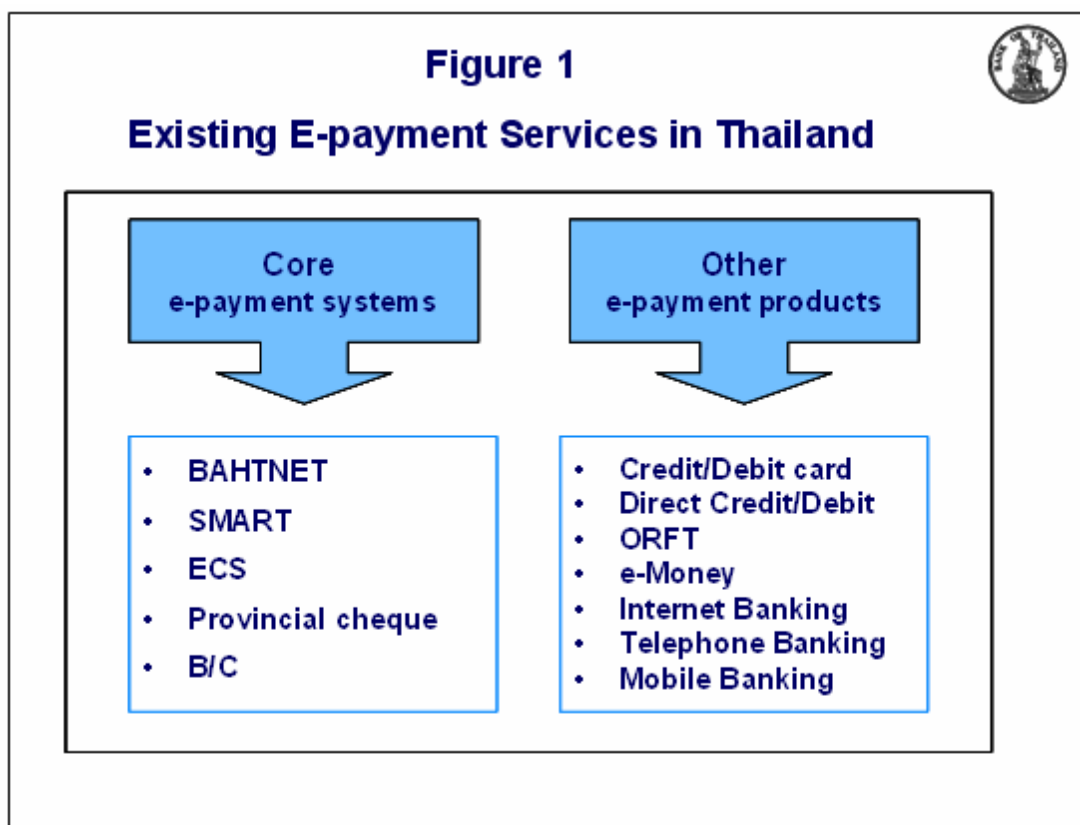


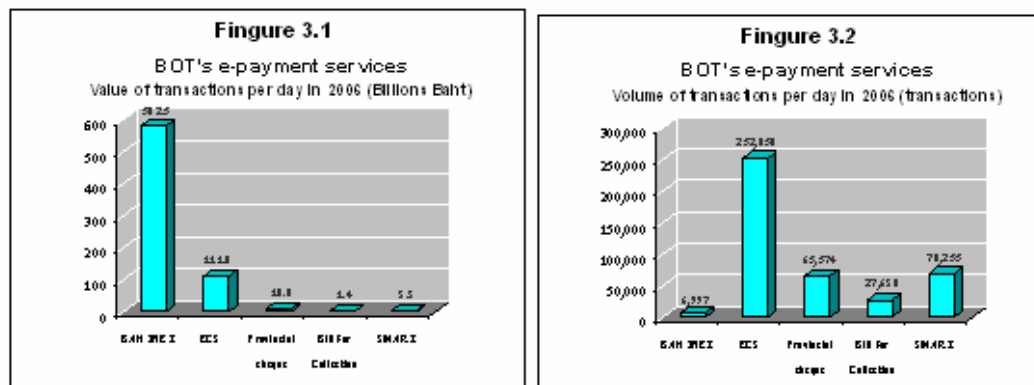
Figure 2 provides more detailed information with respect to the nature of e-payment system operated by the BOT as well as the year the respective system has been put into operation. As one can see from the figure, in the year 1995, 1996 and 1997, the BOT launched three major types of payment systems of BAHTNET, ECS and SMART systems, respectively. The primary objective is to accommodate the national economic expansion through the more convenient, quick and safe systems. In particular, BAHTNET system has been specifically designed for handling large-value financial transactions on the RTGS (real-time gross settlement) basis. It should be noted that, since 15 October 2007 onwards, SMART system has no longer been under the operation of the BOT. It has been, since then, transferred to operate under the National ITMX.

<b>Figure 2</b>		
<b>Payment Systems operated by the BOT</b>		
<b>Type of services</b>	<b>Major features</b>	<b>Period in operation</b>
<ul style="list-style-type: none"> <li>• BAHTNET (Bank of Thailand Automated High-value Transfer Network)</li> </ul>	A large-value electronic funds transfer system (Inter-bank, Third Party) with RTGS transactions	May 24, 1995
<ul style="list-style-type: none"> <li>• ECS (Electronic Cheque Clearing System)</li> </ul>	The system for electronic data presentment and clearing of inter-bank cheques in Bangkok and the metropolitan areas	July 16, 1996
<ul style="list-style-type: none"> <li>• SMART (System for Managing Automated Retail funds Transfer)</li> </ul>	A small-value inter-bank funds transfer system	January 16, 1997
<ul style="list-style-type: none"> <li>• Provincial Cheque Clearing</li> </ul>	The system for collecting inter-bank cheques within the province	September 15, 1997
<ul style="list-style-type: none"> <li>• B/C (Bill for Collection)</li> </ul>	The system for collecting inter-bank cheques across the provinces	February 14, 2003

Source: Compiled from data base of BOT's Payment Systems Department.

It should be noted in this connection that e-payment transactions through the BAHTNET system has gained the highest share, followed by ECS. As is clearly seen from Figure 3.1, the value of transaction per day via BAHTNET and ECS accounted for around 431.2 and 102.3 billions baht in 2005, respectively. However, such a sequence of ordering appeared to have changed significantly in case one makes comparison by basing on the volume of transaction per day. In the later case, as shown in Figure 3.2, financial transactions through ECS gained the highest share when compared with other channels.

**Figure 3**  
**BOT's E-Payment Services**



Source: Calculated from the data base of the BOT's Payment Systems Department

For a longer perspective, financial transactions via the BAHTNET system have, over the past decade or so, recorded the highest share when compared with some other types of the BOT's payment services. As characterized from Figure 4, the daily average value of transactions via the BAHTNET system accounted for around 78.7 percent of the total value of transactions through payment services channels operated by the BOT. Second in importance in this regard is related to the financial transactions via ECS, accounting for about 18.7 percent.

**Figure 4**



**Financial transactions via payment service operated by the BOT**

Payment systems	Value of Transactions per day (in Billion Baht)						
	2000	2001	2002	2003	2004	2005	2006
BAHTNET	280.39 70.39%	288.21 80.69%	273.86 77.87%	316.36 77.68%	302.00 74.43%	431.16 78.73%	582.53 82.07%
ECS	102.58 27.73%	61.71 17.28%	69.33 19.71%	81.00 19.89%	92.00 22.68%	102.30 18.63%	111.83 15.76%
Provincial cheque	6.47 1.75%	6.52 1.83%	7.40 2.10%	7.80 1.92%	8.30 2.05%	9.68 1.77%	10.77 1.52%
B/C (Bill for Collection)	-	-	-	0.50 0.12%	1.10 0.27%	1.24 0.23%	1.35 0.19%
SMART	0.49 0.13%	0.75 0.21%	1.12 0.32%	1.60 0.39%	2.30 0.57%	3.29 0.60%	3.30 0.46%
<b>TOTAL</b>	<b>369.91</b> <b>100 %</b>	<b>357.20</b> <b>100 %</b>	<b>351.70</b> <b>100 %</b>	<b>407.26</b> <b>100 %</b>	<b>405.70</b> <b>100 %</b>	<b>547.66</b> <b>100 %</b>	<b>709.78</b> <b>100 %</b>

Source : Calculated from the data base of BOT's Payment System Department

## 1.2 Current Developments of Other E-payment Products

- **Distribution of cashless payment instruments**

Apart from e-payment channels provided by the BOT, there have been significant increases in the use of other e-payment channels offered by commercial banks and non-banks. As one can see, the latter type of e-payment channels is often used for the purpose of small value fund transfers or micro payments. Chief among these include (i) credit cards, (ii) debit cards, (iii) e-money, and (iv) payment channels related to the Internet and mobile phones. For Thailand's case, as portrayed in Figure 5, debit card (with the ATM withdrawer) has the leading position of instrument share. It accounted for almost 39 percent of the total transactions of the cashless payments in 2006. Second importance in this regard is credit card, representing around 30 percent of the total. Similar experience can also be seen for the case of Taiwan. Judging from the penetration rates of non-cash payments in Taiwan, ATM cards recorded the highest share of around 46.5% in 2006, followed by credit cards of about 34.5%.

Noticeably, the share of debit card in the total cashless payment tended to have increased from around 32.7% in 2004 to nearly 39% in 2006. This rise in the debit card share appeared to come up with the expense from certain types of payment instruments, especially paper cheque (reducing from 13.5% to 10%) and credit transfer (reducing from 15.5% to 14.6%). As will be discussed in more details in subsequent sections, some of these new types of payment services, in particular ORFT, have experienced a reasonably high growth rate over the past many years. This has, to some certain extent, contributed to a greater presence of e-payment in Thailand when compared with some countries in the SEACEN region.

Although debit card with ATM withdrawal has experienced the largest portion as mentioned above, this seems to be not the case when judging in terms of the value of transactions. As is evident from Figure 5, some forms of the paper-based payment instruments, particularly cheque, has continued to record the lion share in the total value of non-cash transactions in retail payments. The share of cheque accounted for around 80% in the total value of non-cash transactions over the years 2004-2006, while debit card gained around only 5% during the same period.<sup>4</sup>

Looking at the aggregate data reported in Figure 5 tends to provide a number of interesting observations. For one thing, it indicates while e-payments has continued to grow over the past many years, some form of paper-based payment instrument, especially cheques, tended to have still retained the lion share in the total value of non-cash transactions over the corresponding period. As one can see, in value term, the share of cheques usage was recorded at nearly 80% over the years 2004-2006. For another, it indicates that most of the e-payment instruments have been used for the purpose of small value fund transfer and/or micro payments.

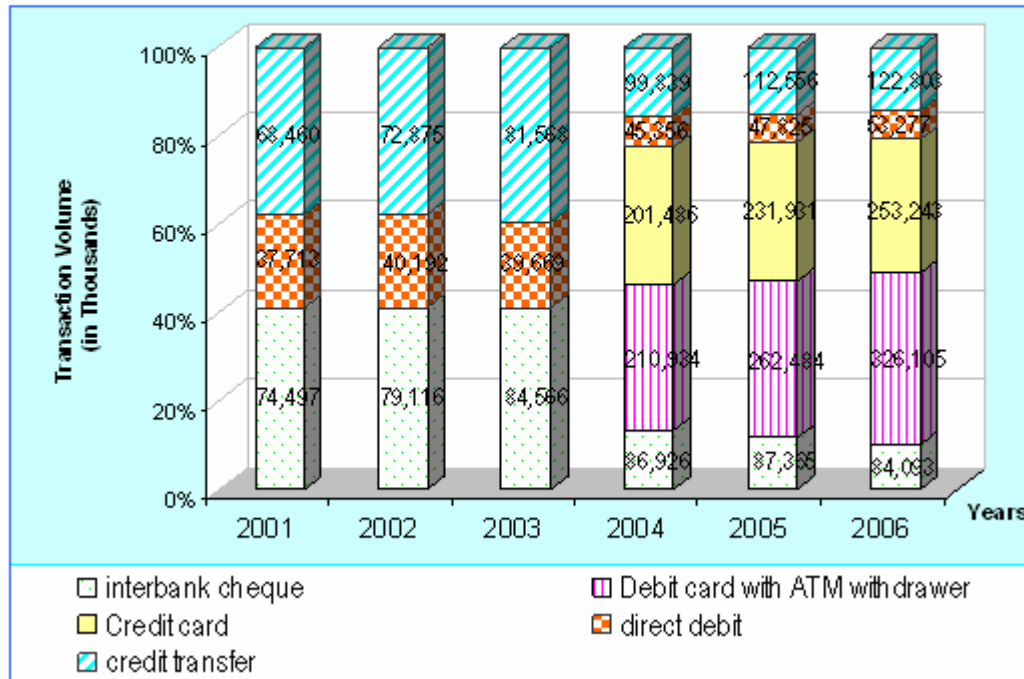
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<sup>4</sup> This may in part reflect the fact that debit cards are often used for conducting transactions for small-value payments. Cheques, by contrast, are normally used by businesses for making larger-value payments. Personal cheques with quite small-value payments remain very limited used in Thailand.

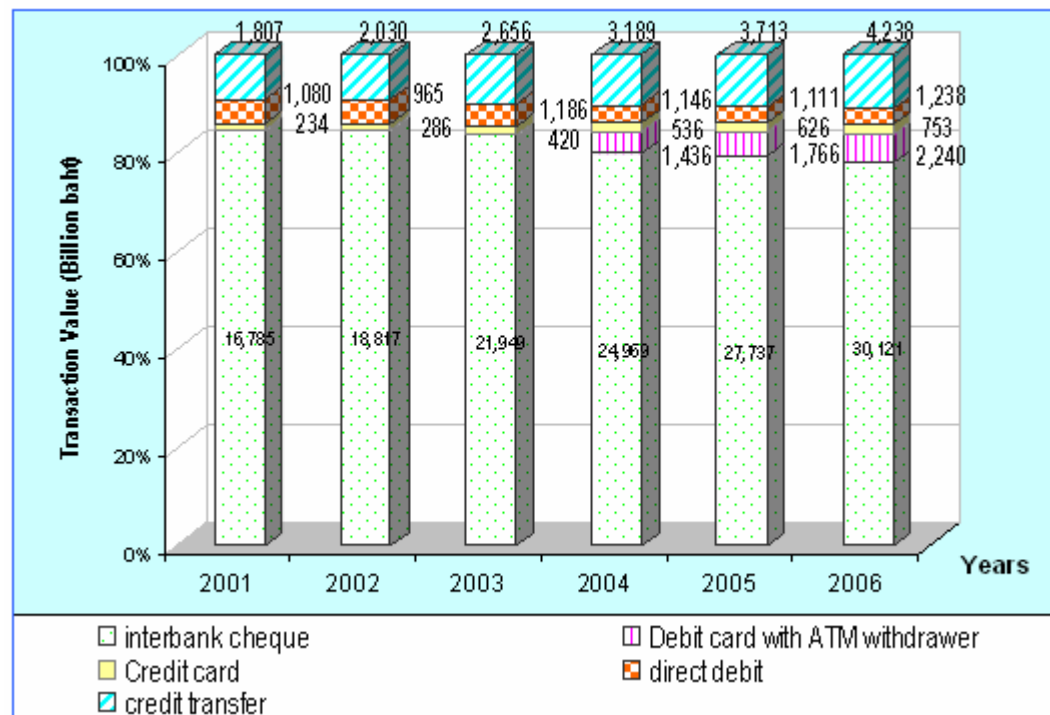
**Figure 5**  
Distribution of Cashless Payment in Thailand



*Volume*

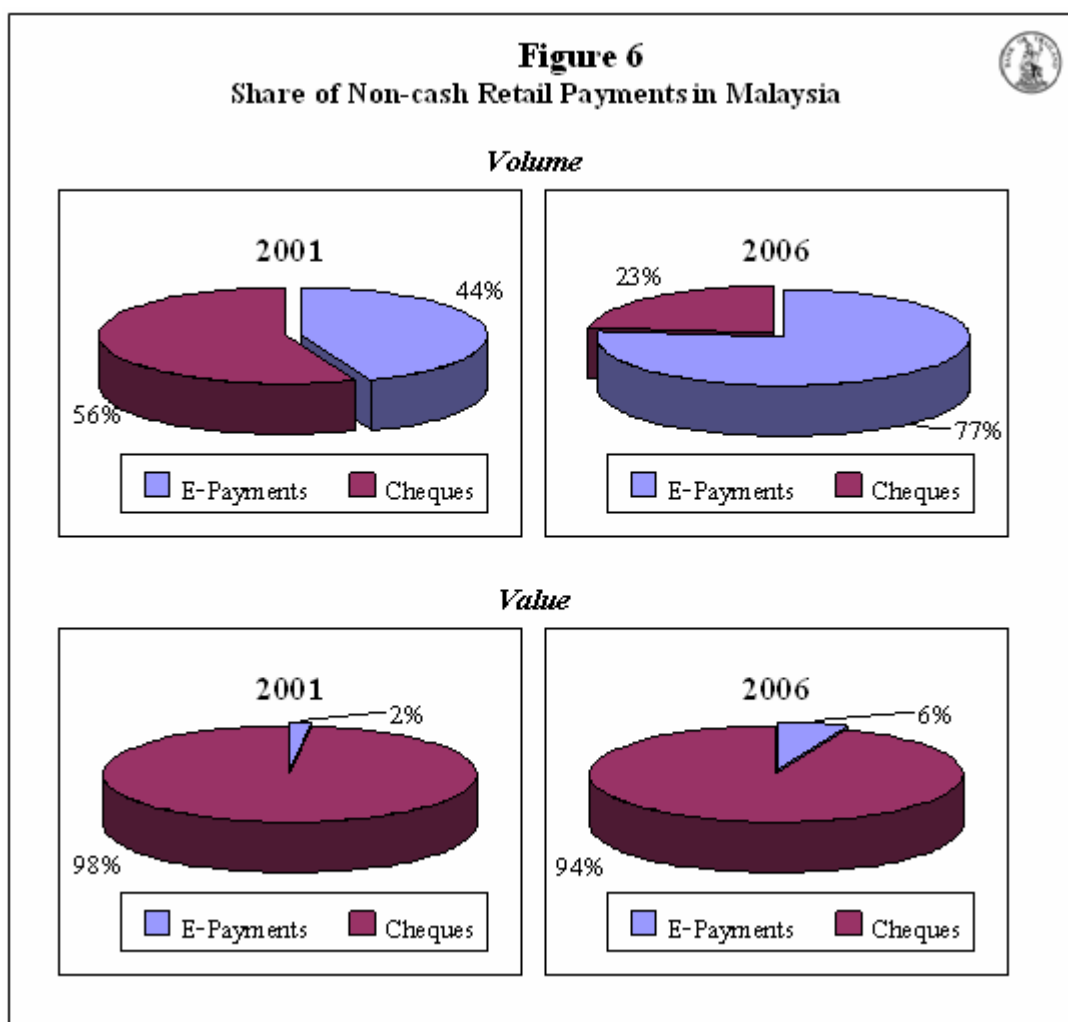


*Value*



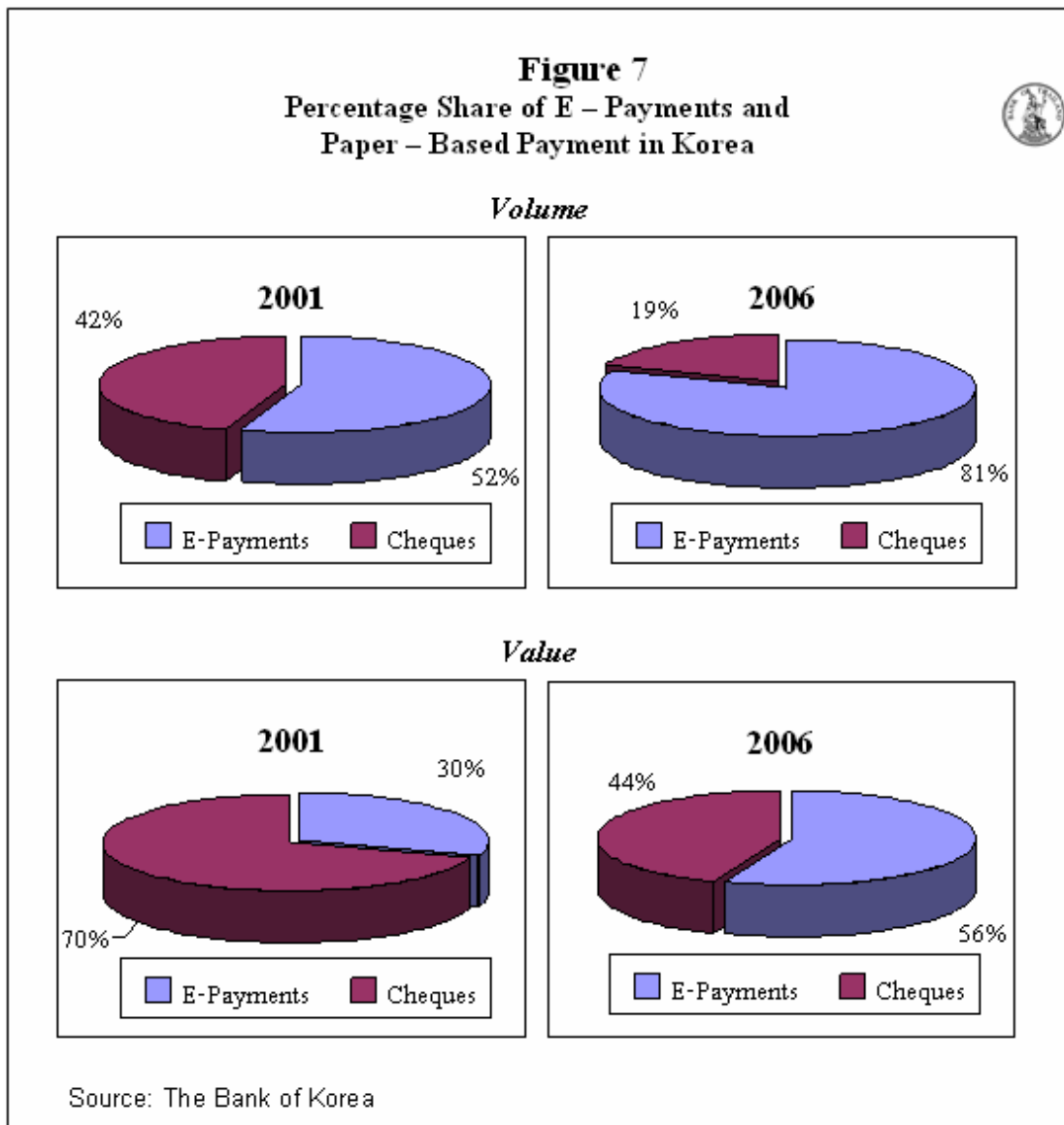
Source: Calculated from the data base of BOT's Payment System Department

It is useful at this point to provide some reference to the experiences of some countries in the SEACEN region. In the case of Malaysia, although e-payments have gained an increasing share in the past many years, cheque usage has still retained the significant portion in the total non-cash payments. According to the Figure 6, the share of e-payments in volume term has jumped up from around 44% of the total non-cash transactions in 2001 to about 77% in 2006. This has come up with the expense from cheque usage which recorded the sharp decline from around 56% to 23% over the corresponding period. Nonetheless, the development of this kind seems to be less clear when looking at the figures in value term. In the latter case, the share of e-payments of the total non-cash transactions recorded a marginal increase from around 2% in 2001 to 6% in 2006. Accordingly, it is evident that cheque use still dominates the retail payments in Malaysia when judging in terms of the value of the transactions.



Source: The Bank Negara Malaysia

Looking at data in Figure 7, one can see that Korea is probably only the country in the SEACEN region that has shown the prevalent use of e-payments. As revealed in the figure, e-payments have currently surpassed the use of cheques as the preferred means of making non-cash payments.<sup>5</sup> In volume term, the share of e-payment amounted to 80%, while that of paper-based instruments accounted for only 20% in 2006. Similar observations can be made when considering in value term, although the pace of growth tended to be relatively less pronounced when compared with the former case. With the risk of oversimplification, the degrees of e-payment penetration in Korea have been much higher than those in other SEACEN member banks.

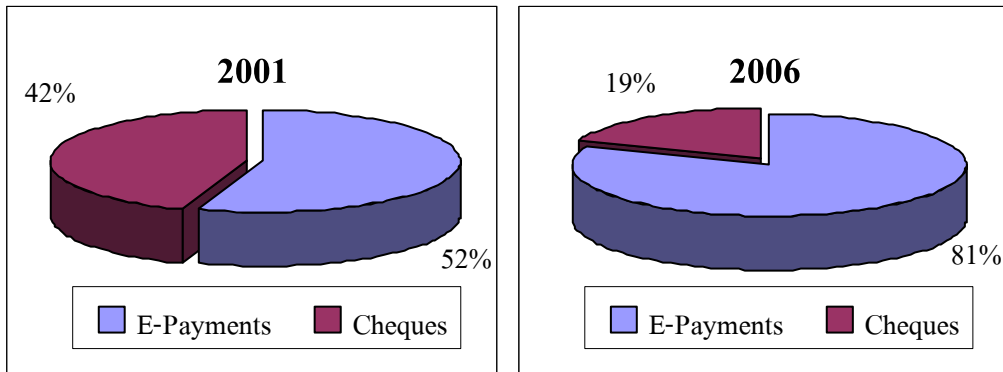


<sup>5</sup> Similar experience can be seen in the case of the United States. According to the Federal Reserve Study, it was found that, for the first time ever, the number of e-payments, including credit card, debit card, and automated clearinghouse (ACH) payments, has exceeded check payments since the year 2003 onwards. See, for example, Kohn (2006) for more details on this.

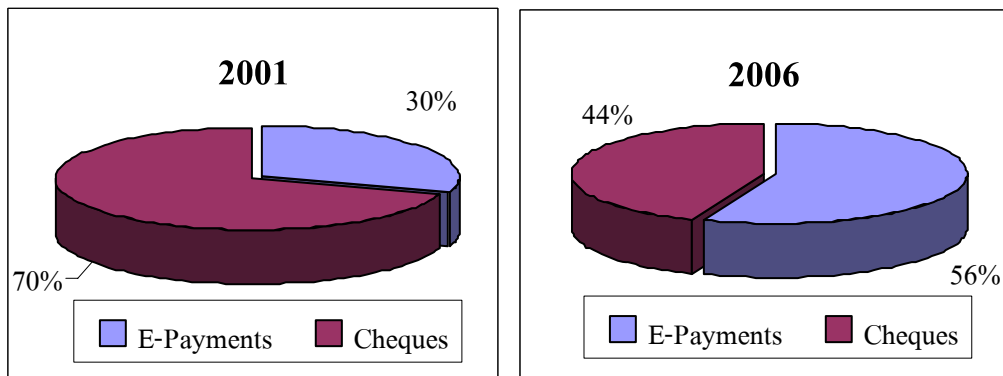
**Figure 7**  
**Percentage Share of E – Payments and**  
**Paper – Based Payment in Korea**



*Volume*



*Value*



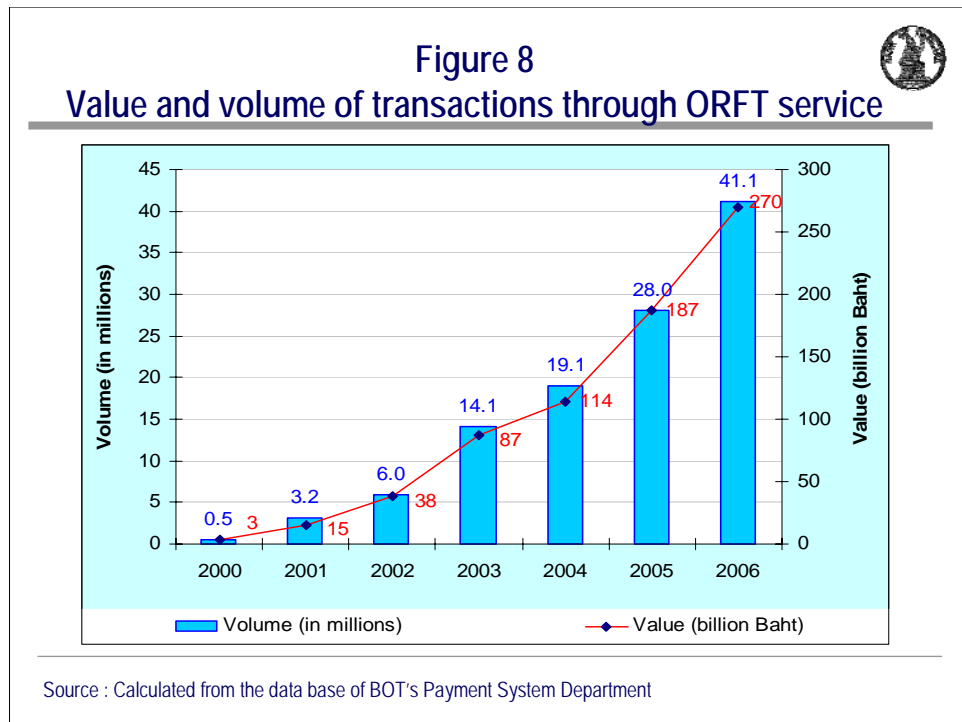
Source: The Bank of Korea



- **Sharp rise in ORFT service**

It is perhaps useful in this connection to shed some light on Thailand's experience in the use of ORFT service via ATM networks. Basically, ORFT is a further development of the ATM system in which inter-bank retail funds transfer can be performed through an inter-bank network using the ATM platform. It is developed by the Thai Bankers' Association (TBA) on advice of the BOT. ORFT, as a kind of e-banking activity, enables a customer of one commercial bank to make retail-level funds transfer to a transferee at another bank on an online basis.

Since the inception in 2000, ORFT has grown remarkably both in term of volume and value. As one can see from Figure 8, the ORFT transaction volume in 2005 was 28 million transactions, increasing from the year 2004 by 46.8 percent. Total value was 187 billion Baht in 2005, increasing from last year by 64.0 percent.

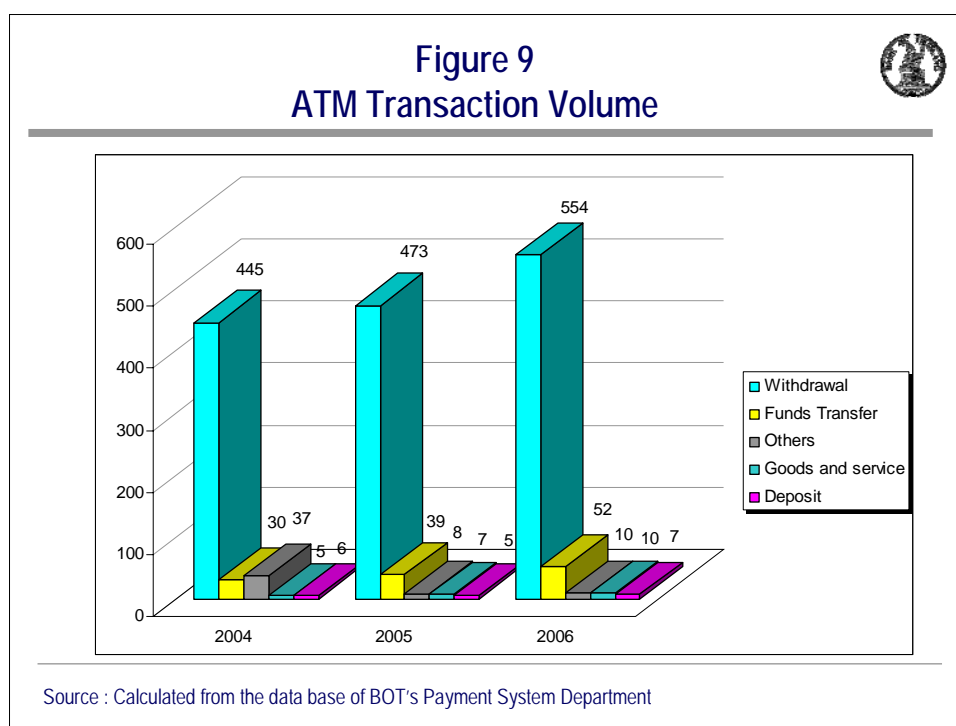


More importantly, since December 2005, ORFT service has been enhanced to cover inter-bank funds transfer service via commercial banks' counters. The customers can use this service at any branches of the participating banks all over the country. The maximum amount of funds transfer is capped at 50,000 Baht per transaction. This service is easy, quick and safe because the transactions will be confirmed by sending banks, which will provide immediate effects on the funds receiving accounts through the online real-time system.

Interesting enough, the volume of ORFT transactions via commercial banks' counters has grown more than 10 folds between December 2005 and May 2006. Specifically, the volume showed an increase from an approximate amount of 18,638

transactions in December 2005 to 202,908 transactions in May 2006. The new services seem to suit for customers' needs, as reflected in the substantial increase in the volume of transactions. From December 2006 onwards, the maximum amount per transaction will be extended from 50,000 Baht to 100,000 Baht.

A closer look at data on ATM transactions also provides very interesting observations in relation to the ORFT service. As one can see from Figure 9, although more than 85% of ATM transactions were in the form of cash withdrawal, the ratio of retail funds transfer via ATM machines has been on a consistently upward trend, rising from around 2% in 2001 to 9% in 2005. Such an increase in the ratio seems to suggest a possibility of higher electronic funds transfer via ATM cards. It is important to point out in this connection that inter-bank funds transfer (Online Retail Fund Transfer-ORFT) has been viewed as the most important component of retail funds transfer via ATM networks. The remainder components are internal funds transfer and funds transfer for good and service payment via ATM machines, including bill payments and filling of funds for prepaid cell phone systems.



Similar experience in the surge of the retail fund transfer can also be seen in some other countries in the SEACEN region. In Malaysia, for instance, the volume of funds transfer through Interbank Giro (IBG)<sup>6</sup>, operated by the Malaysian Electronic Payment System (MEPs), has shown sign of rapid increase over the past many years.

<sup>6</sup> There are three parties to the IBG system: remitting financial institutions, system operators of MEPs, and receiving financial institutions.

According to the Malaysia Country Report, the value per capita increased significantly from around 192.7 Rigit in 2000 to around 1,700.2 Rigit in 2006, reflecting an increase of about 10 times during the mentioned period. Noticeably, the value of funds transfer via the IBG system was the second most important type of non-cash transaction, after cheque.

▪ **Nature of e-money usage in Thailand and in selected SEACEN countries**

Similar to experiences in many other countries, banks have not the only sole service provider of e-payment. In the case of Thailand, some sort of non-banks has recently been able to develop new methods of e-payment. As is evident from Figure 10, there are six non-banks offering e-money business to their clients. Of these, four are operated in the form of network based, while the remaining firm is in the form of card-based. These are (i) True Money Co.Ltd, (ii) PaySbay Co.Ltd, (iii) Payment Solution co.,ltd., (iv) Advance Mpay Co.,Ltd., (v) Advance Magic Card Co.,Ltd., and (vi) Thai Smartcard Co.,Ltd. It therefore does not include the provision of payment services by certain types of non-banks, particularly those of VISA card, Master card, and the like.<sup>7</sup>

There were a number of products gradually launched into the market by the mentioned companies in the past few years, especially “Smart Purse” by Thai Smart Card Co.,Ltd., which can be used for purchase and bill payment at 7-11 Convenience Stores, and those merchant stores participating in the campaign. “OK Cash” card is a product launched by Payment Solution Co.,Ltd. Again, it can be used for purchase and bill payment at merchant stores and food shops participating as members and for fund transfer across smart card issued by the company. This included e-money on computer of PaySbuy Co.,Ltd. It was another type of digital cash for storing the amount of cash on computer for fund transfer, and bill payment via internet such as payment for auctions, utility expenses and downloads of ring-tones for cell phones, etc. For digital cash, customers can transfer funds from digital cash in computer to bank accounts. Besides, there is also storage of money in account of cell phone subscribers, such as “m-Pay service” by Advanced Info Service (AIS) Plc. “Money Service” by TRUE Money Co.,Ltd which can be used for payment of utilities, as well as bill payment at participating member stores, general stores, and some internet shops.

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<sup>7</sup> The term used here refers to some sort of private firms which are involved in the provision of payment services related to e-money business. Apart from the mentioned 6 non-bank firms, Siam Commercial Bank also takes part in providing e-money related services to its customers.

**Figure 10**  
**Some Features of Six Non-bank Corporations**



Company name	Card Based	Network Based	Date for license applications
Thai smart card Co.,Ltd.	✓		May 2005
Advance magic card Co.,Ltd.	✓		June 2005
Payment Solution Co.,Ltd.		✓	June 2005
Advance mPay Co.,Ltd.		✓	June 2005
PaySbuy Co.,Ltd.		✓	July 2005
True money Co.,Ltd.	✓	✓	August 2005

As of December 2006, the total value of e-money transactions by these six firms accounted for nearly 57,000 million baht. Around 90% of the transactions were in the form of filling funds for use in prepaid mobile phone systems, while transaction for purchase goods and services still recorded the negligible portion. This seems to suggest that using e-money as sort of cash substitution product has not yet become materialized. Indeed, the outlook for e-money related businesses appeared to be in great uncertainty. As reported elsewhere, e-money transactions in both volume and value terms experienced substantially negative growth rates in the range of 26%-34% in the year 2007 when compared with those in 2006.

However, it should be noted that in some SEACEN member countries the issuers of e-money are solely in the hand of commercial banks. In Malaysia, for example, the issuance of e-money was traditionally exclusive preserve of banks. Nonetheless, this seems to be no longer the case in the period since 2006, as there has been change in policy towards the new types of e-money issuers. As one can see, non-bank firms in Malaysia have now been allowed to conduct the e-money-related business. In particular, four new electronic schemes carried out by non-bank firms were approved in 2006. As mentioned elsewhere, these newly introduced electronic money schemes provide consumes with additional payment methods for purchases on the Internet and the convenience of using mobile phones for payments.

At this stage, two of the most widely used e-money (e-purse) products in Malaysia are (1) “Touch n’ Go” and (2) “MEPS Cash”. The first type of e-purse is in the form of card-based e-money and can be used as alternative payments for toll fare, parking, and transport fare in Malaysia. The latter one is referred the national card-based e-Purse/e-Money application, available in both Bankcard and MyKad (a

government multipurpose card issued by National Registration Department). MEPS Cash was launched in 2002. The transactions of these two types of e-purse have recorded significant increase (rapid growth) over the past five years. Judging from the volume of transactions per capita, it can be clearly seen that E-purse came first among certain types of payment instruments, including in particular cheques, credit card, charge card, debit card, interbank GIRO, internet banking, mobile banking. The figure for E-purse in 2006 was about 16.0 units, followed by credit card and cheques of 7.8 and 7 units respectively.

Similar to Thailand, e-money in Taiwan can be issued by both commercial banks and non-bank private firms. The e-money in this country is loosely defined as “Multipurpose Stored Value Card” (MSVC) for making general micro-payments which can be divided into card-based and network-based products. Up to now, there have been three pilot e-money schemes offering e-money related businesses. The first among these is “FISCash System” (card-based). The IC Card issued has enabled cardholders to purchase at contracted stores, make phone calls, and pay gas bills, to name but a few. The second scheme is “Mondex-Taiwan System” (card-based). The card system has enabled cardholders to pay taxi fares, buy lotto tickets, and make purchases at convenience stores. The last one is “E-SUN e-Coin System” (network-based). This e-Coin system was launched in February 2003 to provide customers with an online payment instrument, enabling customers to make micro payments for on-line shopping purpose and for those without having a real account with E-SUN Bank.

In a similar vein, the issuance of e-money in Indonesia can be carried out by both commercial banks and non-bank institutions. Currently, there are four e-money operators authorized by Bank Indonesia. Of these, two of them are commercial banks, while the remaining is non-bank private firms. At present, non-bank institutions as the issuers of e-money are dominated by Telecommunication Company. This tends to be in broad consistence with the situation in many other countries such as those in Taiwan and Korea, partly because the well-established infrastructure and technology readiness has been widely accepted as one of the most important factors for a successful conduct of e-money related activities. Broadly speaking, the type of e-money issued by the Telecommunication Companies is server based e-money product with telephone cellular using as a media to make payments. According to the figures from Bank Indonesia, the number of prepaid cards amounted to around 126,211 cards with the value of transactions being recorded at about IDR 591,356,572 as of September.

- **The Life Cycle of Non-cash e-payment products**

It is perhaps useful in this conjunction to provide some preliminary observations regarding the Life Cycle of Non-cash e-payment instruments for the case of Thailand, Taiwan, and Norway. This can be carried out by applying “S Curve”<sup>8</sup> which was previously applied to the context of bank payment services in Norway. As one can see, Figure 11 shows how the life cycle of each type of retail payment instruments and services has developed over the course of the years. Conceptually speaking, the products and services proceed through the life cycle phase from their introduction through subsequent phase of public acceptance, growth, and, eventually, maturity.

As characterized in Figure 11, the ATM cards and EFTPOS tend to be the most widespread e-payment tools in Taiwan, while Internet banking, ACH (Automated Clearing House) and Mobile banking, relatively new types of e-payment mechanisms, have shown sign of continual increase. The latter types of payment products grew at a relatively higher rate when compared with some types of e-payment mechanisms such as e-money and E-bill which appeared to be at the early stage of development. Noticeably, in Taiwan’s context, paper-based products, such as cheque, have experienced a declining trend over the past many years.

In the case of Thailand, explosive growth can be evident for certain types of e-banking activity. This is particularly so for the case of ORFT. Such an exceptionally high growth tends to suggest that the major characteristics of this sort of e-payment product tend to serve the major need of the users. As alluded to in Figure 8, the value of retail fund transfer through ORFT system tended to be of negligible amount of around 3.2 billion baht in 2002. However, the value of the transactions surged to around 41.1 billion baht in 2006, increasing around 14 folds when compared with those in 2002. Additionally, certain types of payment cards, in particular credit and debit cards, have experienced remarkably high growth rates in recent years. On average, as can be seen form Figure 12, every person made around 13 transactions per year using payment cards in 2006, slight increase when compared with those in 2004 and 2005.

Nonetheless, unlike Taiwan and Norway, the other principal paper-based method, the cheque, also remains deeply embedded in the Thai payments system. As shown in Figure 5, 11, and 12, cheque usage accounted for nearly 80% in the total value of non-cash payments in Thailand. But, while cheque usage remains at an extremely high level in terms of value, its share is trending downward in terms of volume. As one can see, the share of cheque in volume term has recorded a continuous decline over the past years, dropping remarkably from around 41.2% in 2001 to 13.5% in 2004 and 10.0% in 2006.

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<sup>8</sup> For more detailed account on this, see, for example, Gresvik and Owre (2003).

A closer look at Figure 11 suggests that the degree of e-money usage has not yet shown any prominent development when compared with some certain types of e-payment products. As one can see, the growth rate of the value of transactions for e-money products tended to relatively lower than those of credit card, debit card, internet banking. Nonetheless, at the risk of oversimplification, the degree of e-money developments in Taiwan and Thailand appears to be in a better position when compared with most of the SEACEN countries participating in the SEACEN research project, especially those of Indonesia, the Philippians, Vietnam, to name but a few.

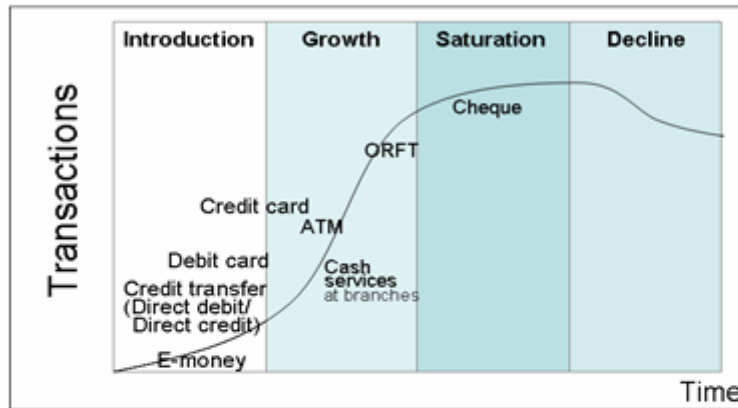
In contrast to the case of Thailand and Taiwan, most of e-payments instruments or products have been widely used in making retail payments in Norway for a longer period of time. As one can see from the Figure 11, some sort of e-payments instruments, in particular PC/Internet giros, EFTPOS, have been widespread use in retail payments in Norway. EFTPOS, for example, has passed from the “Growth phase” to the “Saturation phase”. The use of cheques, one the other hand, has been on the “Declining phase”. Unlike Thailand and Taiwan, there tended to a sharp drop in use of cheques in Norway in the past many years, reflecting the growing substitution of cheques by e-payments.

It should be noted that the most popular payment services tend to be in the “Saturation phase”. In this phase, as has been argued by Gresvik and Owre (2003), services are used by “everyone”. During this stage, the users are familiar with the use of the service, and the technology is no longer a cause for concern. Apart from these, the quality of the service is stable and satisfactory and some services may have surplus capacity. Service providers seem to rely less on the use of marketing incentive. Service providers tend to rely increasingly on the price competition. At the same time, there tend to focus increasingly on the costs of providing services. Most of payment services may have remained in this phase for some time.

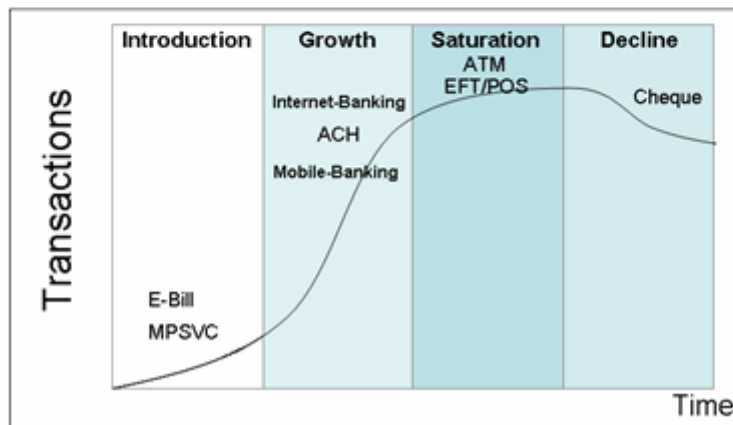


**Figure 11**  
Location of payment service in the life cycle:  
The case of Thailand, Taiwan and Norway

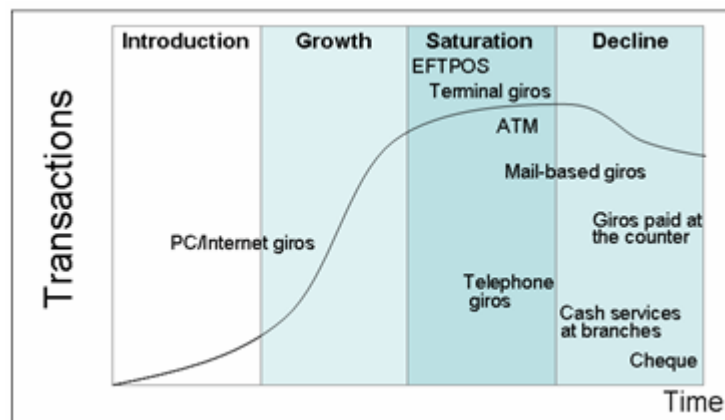
*a) Thailand's case*



*b) Taiwan's case*



*c) Norway's case*



Note: Figures for Norway and Taiwan are respectively based on Gresvik and Owre (2003) and Change (2007), while those of Thailand are the author's estimates.



**Figure 12****Penetration of Cashless Transaction in Thailand**

	Volume per capita					Value per capita (in thousand baht)				
	2002	2003	2004	2005	2006	2002	2003	2004	2005	2006
<b>I. Paper based</b>										
Cheques	<b>1.26</b>	<b>1.34</b>	<b>1.40</b>	<b>1.40</b>	<b>1.34</b>	<b>299.6</b>	<b>348.0</b>	<b>402.9</b>	<b>444.4</b>	<b>479.4</b>
	[6.2]	[6.9]	[2.8]	[0.5]	[-3.7]	[12.1]	[16.6]	[13.8]	[11.1]	[8.6]
<b>II. Card-based</b>										
Debit Card	-	-	<b>3.39</b>	<b>4.21</b>	<b>5.23</b>	-	-	<b>23.1</b>	<b>28.4</b>	<b>36.0</b>
	-	-	-	[24.4]	[24.4]	-	-	-	[23.0]	[26.8]
Credit Card	-	-	<b>3.23</b>	<b>3.72</b>	<b>4.06</b>	<b>4.6</b>	<b>6.7</b>	<b>8.6</b>	<b>10.0</b>	<b>12.1</b>
	-	-	-	[15.1]	[9.2]	[22.2]	[46.9]	[27.6]	[16.8]	[20.3]
E-money	-	-	-	-	<b>3.80</b>	-	-	-	-	<b>0.09</b>
	-	-	-	-	-	-	-	-	-	-
<b>III. Automated</b>										
ORFT	<b>0.096</b>	<b>0.226</b>	<b>0.306</b>	<b>0.449</b>	<b>0.659</b>	<b>0.6</b>	<b>1.4</b>	<b>1.8</b>	<b>3.0</b>	<b>4.3</b>
	[87.3]	[135.6]	[35.2]	[46.8]	[46.7]	[153.3]	[128.9]	[31.0]	[64.0]	[44.4]
Direct Credit	<b>1.17</b>	<b>1.31</b>	<b>1.60</b>	<b>1.81</b>	<b>1.97</b>	<b>32.6</b>	<b>42.6</b>	<b>51.2</b>	<b>59.6</b>	<b>68.0</b>
	[6.4]	[11.9]	[22.4]	[12.7]	[9.1]	[12.3]	[30.8]	[20.1]	[16.4]	[14.1]
Direct Debit	<b>0.65</b>	<b>0.64</b>	<b>0.73</b>	<b>0.77</b>	<b>0.86</b>	<b>17.3</b>	<b>19.0</b>	<b>18.4</b>	<b>17.8</b>	<b>19.9</b>
	[6.6]	[-1.3]	[14.3]	[5.4]	[11.4]	[11.9]	[9.8]	[-3.4]	[-3.1]	[11.4]
<b>IV. Others</b>										
Internet Banking	<b>0.16</b>	<b>0.17</b>	<b>0.08</b>	<b>0.18</b>	<b>0.25</b>	<b>11.7</b>	<b>10.2</b>	<b>18.3</b>	<b>43.7</b>	<b>57.5</b>
	[60.0]	[3.5]	[-52.9]	[127.8]	[39.5]	[8394]	[-12.7]	[78.6]	[139.0]	[31.6]
Mobile Banking	-	-	<b>0.0004</b>	<b>0.005</b>	<b>0.006</b>	-	-	<b>0.012</b>	<b>0.010</b>	<b>0.006</b>
	-	-	-	[1352]	[7.7]	-	-	-	[-16.5]	[-37.0]

Notes: (1) Figures in parentheses refer to year-on-year growth rates.

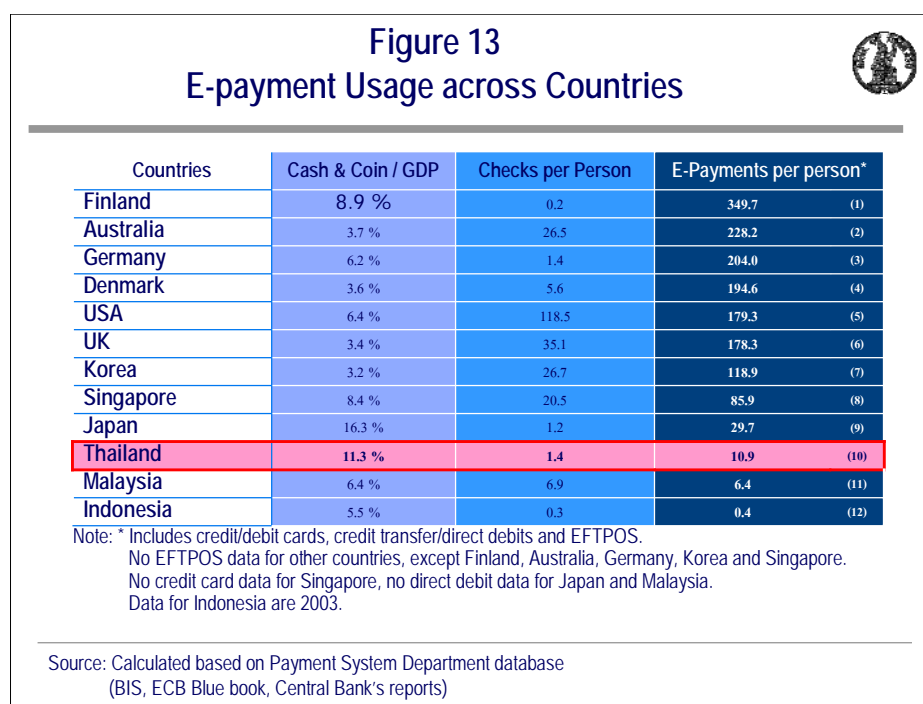
(2) Debit Card refers to debit card with ATM withdrawal.

(3) Data on SMART are included in Direct Credit.

Source: Calculated from the data base of the BOT's Payment System Department

### 1.3 International Comparison of E-payment Penetration

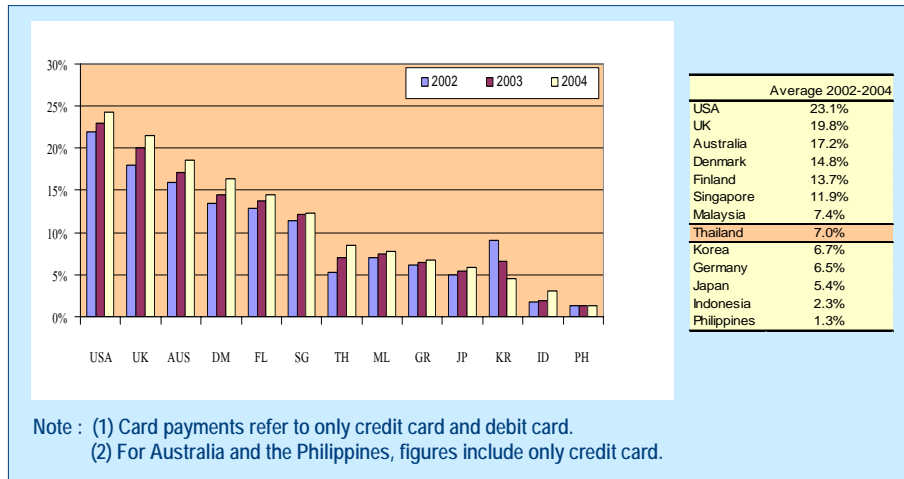
As is evident from Figure 13, Thailand tends to perform reasonably well when compared with its peer-group countries such as Malaysia, Indonesia. As one can see, using e-payment per person as the benchmark for cross-country comparison, the average volume of e-payment per person for Thailand appeared to be around 11 transactions per person per year. This tended to be relatively higher when compared with the corresponding figures in some of the ASEAN countries.<sup>9</sup>



It is perhaps interesting to point out that similar conclusions can be made when certain types of indicators are used as the benchmark for making such comparison. As one can see, using “value of card payments relative to GDP” as the benchmark for making cross-country comparison, Thailand still performed reasonably well when compared with some of the ASEAN countries. As is evident from Figure 13, the ratio of card payment to GDP for Thailand’s case was about 7%, which is relatively higher than certain countries in the ASEAN region.

<sup>9</sup> In the recent study of international comparison of e-payment penetration, the authors have resorted to a variety of indicator for the measurement of the degree of e-payment usage among 13 countries in the sample groups. These include, for instance, (i) the ratio of card payments relative to GDP, (ii) mobile penetration (iii) degree of internet usage, to name but a few. For more detailed account on the issue of e-payment penetration, please see the recent paper by Rungsun Hataiseree and Jittra Boonsiri (2006).

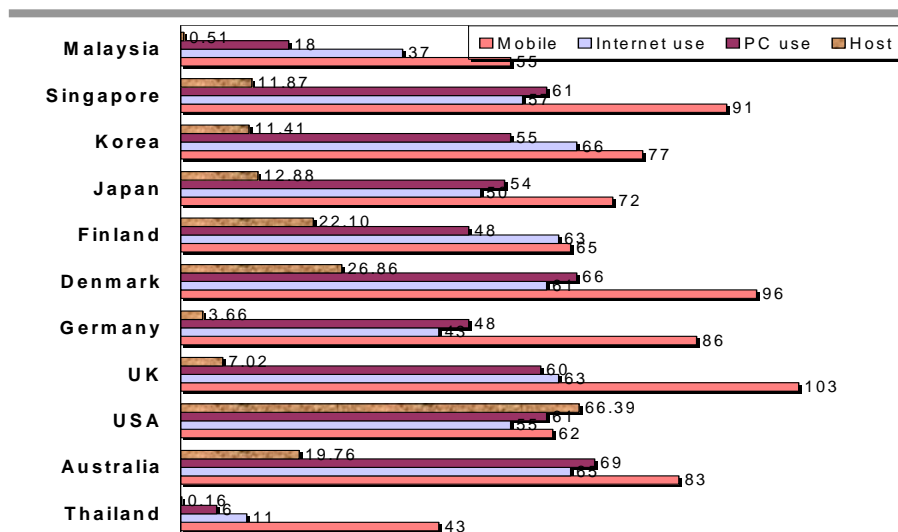
**Figure 14**  
Value of card payment relative to GDP



Source : Calculated from Payment System Department database (BIS, ECB Blue book, Central Bank's reports)

A closer look at some sorts of indicators of e-payment penetration at the Micro Level tended to provide a similar conclusion when judging from macro-level indicators. Using “mobile phone penetration” and “degree of internet usage”, as the benchmark for making cross-country comparison, Thailand still performed reasonably well when compared with some of the ASEAN countries, except that of Malaysia and Singapore (Figure 15)

**Figure 15**  
Connectivity across countries



Note : Connectivity refers to the spread of new e-payment related services

Source : Calculated from Payment System Department database (BIS, ECB Blue book, Central Bank's reports)

## **II. Some Reflections on the Impact of E-payment on Central Banking Functions**

### **2.1 Impact of E-payments on the Operation of Monetary Policy**

The analysis in this section is given to the issue of effect of e-payment development on monetary policy management and financial system stability. As has been reported elsewhere, see for examples, Banque De France (2001) and Arnone and Bandiera (2004), some form of e-payment may have exerted impact on demand for central bank's reserves and reserve requirements, thus causing doubts on the ability of central banks to influence short-term interest rate.

Apart from this, increasing attention needs to be directed to the growing use of credit and debit cards in making retail payments. These sorts of e-payment instruments, as it can be argued, tend to be close substitutes for banknotes. It appears that the widespread use of certain types of e-payment devices would speed up the velocity of narrow money and substituting for the use of physical cash, thus influencing the central bank's monetary policy decision making in the short term.

In view of this, the monetary authorities have to keep a closer look at the recent developments of the accessed products of e-payments such as those related to e-money, EFTPOS, E-banking, E-cheques. Apart from this, effort needs to be given to the developments of some form of card-based e-payment products such as credit and debit cards. Care needs to be taken to see whether the increased use of these types of e-payment products would speed up the monetary transmission mechanism through the prospective increase in the velocity of money and money multiplier. Additional attention needs to be taken to see whether such the increased use would enable the local financial system become more sensitive to systematic contagion effect during the period of break out financial crisis.

In Thailand's case, preliminary evidences obtained so far tend to suggest that the impact of e-payment on the operation of monetary policy has *not* yet produced any sort of serious concern on the part of the Thai monetary authority. This is partly because the relatively minimal size of the e-money transactions when compared with the money supply. As one can see from Figure 15, the percentage share of e-money on the total supply of money (M1) accounted for less than 1% in 2006. It is important to point out in this connection that the share of e-money appears to be much lower when the definition of e-money used refers only to the type of e-money activities that are exclusively used for "multi-purpose transactions". As revealed in the Payment Systems Report (2006), the figure for the latter type of e-money definition, which excludes figures on top-up cards, is reported to be in the approximate value of 5,530 million baht in 2006.



**Figure 16**  
**Likely Impacts of E-payment on Central Bank Functions:**  
**Thailand's Preliminary Evidence**

	<b>Likely Impact</b>	<b>Some Supporting Evidences</b>
<b>•The Effectiveness of Monetary Policy</b>	<ul style="list-style-type: none"> <li>▪ No significant impact</li> <li>▪ The current level of e-money use does not seem to pose a threat to the stability of the financial system.</li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>On Macro Level:</u></li> <li>▪ Less than 1% of e-money in relation to M1.</li> <li>▪ No real evidence indicating the shift of the velocity of money</li> <li>▪ <u>On Micro Level:</u></li> <li>▪ More than 90% of e-money was used in the form of topping up funds for mobile phone usage.</li> <li>▪ Negligible proportion has been used for transaction purpose to pay for the purchase of goods and services.</li> <li>▪ Lack of extensive use of some forms of cash substitution products such as debit cards, e-purse</li> </ul>
<b>• Overall Integrity of the Payment System</b>	<ul style="list-style-type: none"> <li>▪ No real concern</li> </ul>	<ul style="list-style-type: none"> <li>▪ Continued monitoring the impact of e-money on safety and efficiency of the payment system;</li> <li>▪ Putting in place the requirement for the maintenance of the 100% Float for e-money issuers at commercial banks.</li> </ul>

Apart from this, similar to the experience with many countries in the SEACEN region, there tends to be a slow progress in the development of e-money devices in the country. As pointed in Section 1, in most SEACEN member countries, e-money related businesses tend to be at the initial stage, particularly when compared with those in the advanced economies. Indeed, some of the service providers of e-money find it increasingly difficult to cope with the relatively high fixed cost of investment in light of relatively slow growth in the demand for this sort of product/service.

As mentioned elsewhere, there tends to be *no* strong evidence indicating that e-money would displace bank notes or the settlement services that are offered by central banks in the foreseeable future. In the Thai context, the pace of e-money businesses appears to be far from reaching critical mass. As pointed out in Section 1, there are currently six non-banks offering the e-money services. Most of them started their operations in the year either 2005 or 2006. As the experiences have shown, the actual operation of some of these firms tends to be far from being successful. Indeed, some of them are expected to withdraw from the market place. More detailed account of this can be seen from the recent Annual Report of the Payment System Department.

More interestingly, as will be discussed in more details in Section 3.1, consumers and businesses in Thailand have not yet perceived that e-money in the form of e-purse or stored value cards (SVCs) can be compete perfectly with traditional currency for payments in small transactions. It follows that, on the users' point of view, e-money is just only a *partial substitute* for currency. In their views, there are still substantial differences between bank notes and coins and e-cash. As has been often claimed, e-cash can be used for very small payments, does not grant

anonymity to the parties involved, and bears a higher risk for the holder than central bank notes, since the issuer is not risk-free issuers.

Under these circumstances, the treat posed by the use of e-money on the conduct and implementation of monetary policy tends to have produced *no* real concern for the Thai monetary authorities, especially with respect to the control of targeted policy rates, e.g. the 1-day repurchase rate<sup>10</sup>. Similar experience can be found in countries where the degrees of e-payment penetration have been claimed to be in a relatively higher position when compared with those of Thailand. As pointed out in Freeman (2000), central banks would continue to influence the very short-term rate of interest, even in the situation where bank notes or the settlement services that are offered by the central banks have been fully replaced by e-money.<sup>11</sup>

Similar arguments can also be seen from the recent paper by Arnone and Bandiera (2004). In their views, central banks still retain control over short-term interest rates, as long as settlement takes places on the books of the central bank. Settlement of this kind, as it can be argued, would give rise to a positive demand for central bank money. Under these circumstances, the central bank can exert influence on the whole structure of interest rates by varying the interest rate on these overnight balances. By doing so, the central bank can have influence on aggregate spending, the level of prices, and real variables. Additionally, as it can be claimed, financial institutions will have to consider risks inherent to their liquidity positions and their ability to minimize settlement balances by buying or selling funds in the interbank market, considering the rewards and punishment structure set by the central bank.

In light of the discussion above, there seems to be no evidence indicating the real impact of the stored-value e-money on the conduct of monetary policy at this stage. However, the situation may be significantly different in case where the issuance of e-money is non-bank private firms. In this case, the pace of e-money developments would have exerted adverse implications on the conduct and implementation of monetary policy, especially in the situation where the floating fund is not maintained at the commercial banks. This is partly because the e-money usage may have potentially caused the reduction in the bank's deposit, thus affecting the total supply of money. In view of this, the monetary authorities may have to take into account the development of e-money products in the management of monetary policy in the period ahead.

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<sup>10</sup> The rate was adjusted downward from 3.50% to 3.25% since 18 July 2007 onwards.

<sup>11</sup> Apart from this, Freeman (2000), notes that e-money is unlikely to reach critical mass usage and hence would have limited impact on the ability of central banks to influence interest rates. Also, many central banks have already placed less emphasis on monetary aggregates as indicators in the conduct of monetary policy.

## 2.2 Impact of E-payment on the Overall Integrity of Payment System

As alluded to above, evidences so far show that there tends to be *no* significant impact of e-payments, in terms of the accessed products of e-payments and the card-based e-payments, on the conduct of monetary policy in the case of Thailand. Given the growing volume of e-payment transactions over the past many years, as shown in Section 1, there has been growing recognition among the Thai authorities concerning *potential risks* of e-payment that might have had on the financial system stability. As one can see, certain e-payment systems/services may carry potential risks due to the nature of their business model. Examples in this regard include the operational risk associated with some failures of non-bank institutions. The risks involved in the growing e-payment transactions might have produced an adverse impact on the entire financial system. This seems to be particularly so in cases where certain kinds of necessary regulatory measures and/or frameworks have not properly been put in place.

As mentioned in Section 1, non-bank firms are allowed to offer new payment methods/instruments in the form of e-money. On one hand, this sort of practice can be seen as a good sign from the point of encouraging competition and innovation. On the other hand, however, it may have raised the potential risks to the payment system. In view of this, the BOT, as a regulator, needs to put in place a regulatory regime that can address such potential risks. As commonly agreed, commercial banks and non-bank firms as operators of these new types of e-payment products have to face the risks adhering to such activities. Among these risks are credit risk (credit default), liquidity risk (liquidity shortage), legal risk (legal uncertainty), operational risk (system break off). The nature of these risks, as it can be argued, tends to be of some difference when compared with the risks encountered by market participants in the case of large-value e-payment system such as BAHTNET.<sup>12</sup>

In response to such potential risks associated with e-payment systems for retail payments, policy decisions have recently been made to introduce certain types of legislations that can be used as a tool to govern the conduct of e-payment businesses among economic agents. Chief among these include the enactment of the “Electronic Transactions Act of 2001” and the recent proposal of the “Royal Decree Regulating E-payment Business”. At the same time, the BOT has attempted to put in place some sort of regulatory framework that support e-payment usage and foster “public trust”, especially with regard to the introduction of e-transaction law and e-documented law.

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<sup>12</sup> As pointed out in the paper by Rungsun and Sayan (2002), the risk involved in the payments system can be broadly classified into 6 major categories: (i) credit risk, (ii) liquidity risk, (iii) systemic risk, (iv) FX settlement risk, (v) legal risk, and (vi) operational risk. The BOT, with an aim to support the smooth functioning of high-value funds transfers via BAHTNET, has initiated several policy measures to help reduce various types of risks involved, in particular credit risk and/or systemic risk from the payment and settlement process. Of particularly important are: (i) the pricing incentive scheme to encourage an early transfer of funds, (ii) the so-called 30:70 percent measure, (iii) the high-value cheque migration, (iv) the use of credit balance from cheque clearing.

In addition, the BOT has been in a better position to monitor the development of many types of e-payment activities. This is mainly due to the BOT's ability in collecting data and compiling statistics on e-payments transactions. Since the 2006 onwards, data on numerous kinds of e-payments have been publicly reported. As one can see, it is now possible to have data on bill payment at bank counter, the use of e-money, the use of mobile banking, the use of internet banking, to name but a few.<sup>13</sup>

From a regulatory perspective, the BOT has in a better position to put in place a series of regulatory measures aimed at containing the adverse impact from a growing use of e-payment. If the situation is called for, the BOT would consider introducing some of the following measures. These include, for instance, (1) enlarging the coverage of reserve requirement to include e-money, (2) introducing 100% float; and (3) setting ceiling on certain types of e-payment transactions.

As one can see, the present framework for the observation of legal reserve requirement has *not* yet included non-bank issuers of e-money in the calculation of legal reserve requirement. In case where the overall framework of monetary policy management is affected by the recent surge in the use of e-money products, the monetary authorities have many options to mitigate the potential risks associated with such e-money activities. Among the options include the enlargement of the coverage for the ongoing components of the legal reserve requirements. Similar policy decision can be made for the case of the accessed products of e-payments such as EFTPOS, E-banking.<sup>14</sup>

Evidences obtained so far have shown that there tends to be no real concern for the treat of e-money and other forms of e-payment services/products on the stability of the country's financial system. Nonetheless, like many other central banks in the SEACEN region, the BOT finds it necessary to formulate a regulatory framework on e-money. The basic aim is to minimize risks associated with e-money related business to safeguard users' interest and instill confidence in its use. Example of the measures in this regard include: (i) management of float balance, (ii) management of fee charge, (iii) management of dispute resolution, (iv) management of data confidentiality, (v) introduction of IT security and control, and (vi) establishment of adequate governance and operational arrangements to ensure the integrity of the e-money scheme.

Reflecting some sort of regulatory concern, the "float", defined as the value stored in advance by prospective customers of service providers for e-money related businesses, are required to keep as deposits at the commercial bank's account in full

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<sup>13</sup> More detailed account of this, see, for instance, (i) Rungsun Hataiseree and Jitra Boonsiri (2006), (ii) Rungsun Hataiseree, Don Nakornthab, and Jitra Boonsiri (2007), and (iii) Payment Systems Annual Report of the BOT.

<sup>14</sup> It should be noted that some of these measures have been applied to some countries in the SEACEN region. As pointed out elsewhere, the Bank of Indonesia, for instance, has put in place the ceiling on certain types of e-payment transactions. For more details, see Country Paper of Bank Indonesia.



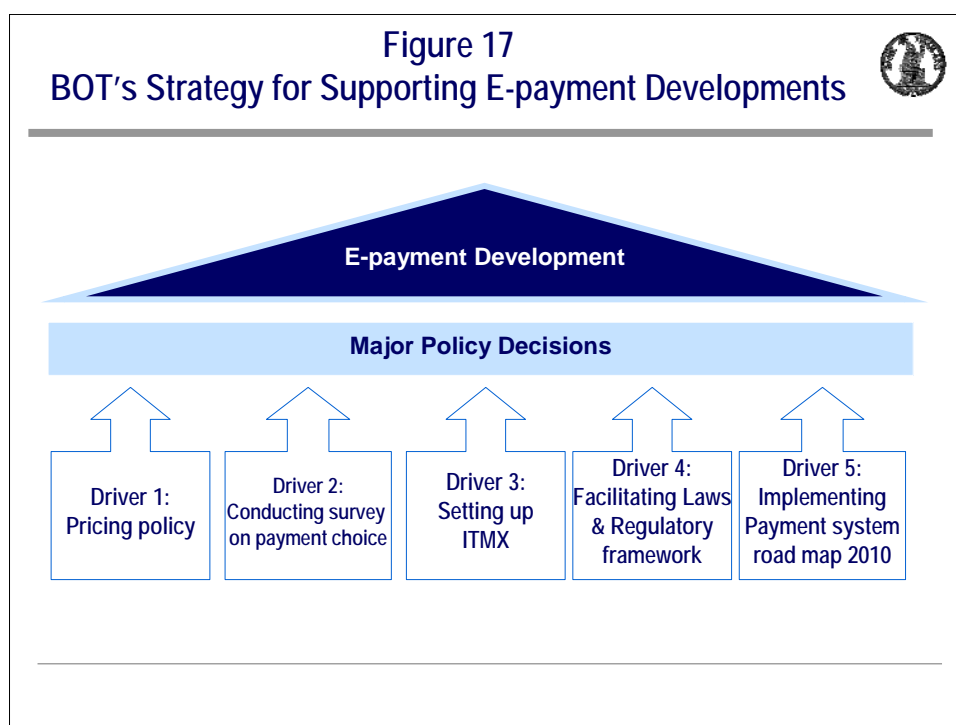
amount. It is also stipulated that this amount of funds has to be kept separately from other accounts. As part of measures to safeguard the system from the associated risks, the BOT has stipulated that the “float” has to reserve for the exclusive use of customers only.

Against the background above, it seems to be no surprise to find no evidence indicating the adverse impacts of e-payment developments on the core functions of the Thai central bank, especially those related to the operation of monetary policy and the stability of the financial system. Indeed, evidence so far for other central banks in the SEACEN region tended to have provided similar conclusions to the case of Thailand, although the pace of the impacts tends to slightly differ from country to country. This can be clearly seen from a series of the Country Reports of central banks participating in the SEACEN project on e-payment developments and impacts on the central bank functions.

### III. Responding to New Payment Challenges Regarding E-Payments

The BOT has over the past many years initiated numerous policy responses regarding e-payment development. The primary aims of these initiatives are to encourage greater use of e-payment by market participants. Chief in this regard include:

- Growing reliance on the use of pricing policy to encourage greater use of e-payment;
- Conducting study survey on payment choice by consumers and businesses;
- Setting up the New Payment Gateway Services of ITMX;
- Facilitating and fostering changes in legal and regulatory framework.




#### 3.1 Growing reliance on the use of pricing policy

Like central banks in many other countries, the BOT has over the past many years resorted to the use of pricing policy with an attempt to encourage an increased use of e-payment products instead of paper-based payment instruments in the retail payment markets. A good example in this regard is the introduction of the new structure of payment fees for different types of payment products, effective on 6 March 2006. Apart from using it as a mean to promote greater use of electronic

media, the setting up of this new payment fee structure is also intended to reflect actual costs of payment services among commercial banks<sup>15</sup>

**Figure 18**  
**New structure fees on payment service/product**



Payment service	Old structure fees	New structure fees
<b>Effective date from March 6, 2006</b>		
Cheque	5 baht per cheque ( inclusive of 3 baht stamp duty, service charge 2 baht )	15 baht per cheque ( inclusive of 3 baht stamp duty, service charge 12 baht )
Provincial cheque (B/C)	20 baht per cheque ( for each 10,000 baht, minimum fee is 10 baht )	10 baht per cheque ( for each 10,000 baht, minimum fee is 10 baht )
ATM (On-line Retail Funds Transfer)	35 baht per transaction ( for ≤30,000 baht )	25 baht per transaction ( for ≤10,000 baht )
		35 baht per transaction ( for > 10,000 to 30,000 baht )
<b>Effective date from April 3, 2006</b>		
SMART credit (Inter bank credit transfer)	10 baht per transaction ( for ≤ 500,000 baht )	12 baht per transaction ( for ≤100,000 baht )
		40 baht per transaction ( for > 100,000 to 500,000 baht )
		100 baht per transaction ( for > 500,000 to 2,000,000 baht )

As one can see from Figure 18, fees on paper-based payment instruments have been adjusted upward to induce the shift towards a greater use of similar kind of substitution payment instruments such as e-payment products. For instance, fees on using physical cheques were raised from 5 Baht to 15 Baht, reflecting an increase of around 200%, while fees on e-payment products such as ORFT were adjusted downward from 35 Baht to 25 Baht for transaction worth less than 10,000 Baht.<sup>16</sup> Although it seems to be too early to provide a detailed assessment of the impact of price changes, preliminary data obtained thus far tend to point to favorable responses from such price changes by businesses and individuals.

However, it is worth pointing out that price factor is just part of the overall factors in determining the consumer choice in using different types of payment instruments in making payment. According to the recent survey by the Payment Systems Department of the BOT, it is found that more than 85 percent of respondents

<sup>15</sup> The BOT has approved a guideline for payment fees setting among commercial banks to reflect actual costs of services, and promote greater use of electronic media, with reduction in use of cheque and cash usage. The new payment fee structure among commercial banks has been in place since March 2006. The use of fee structure has, in fact, been successful in many countries, moving the whole economy to increasingly rely on electronic payment systems.

<sup>16</sup> It should be noted that these new fees are the ceiling rates to be charged from the customers by commercial banks. In practice, each bank still retains the right to accordingly set out its rates deemed to be appropriated.

from the business sector still prefer to use cheque as the major means in making payment. This is mainly because businesses perceive cheque as the most convenient method of payment to their trading partners. Apart from this, they also view that cheque can be served as evidence in case there is something wrong occurring in the process of making payment.

The experiences mentioned above tend to be in large part similar to those found in the U.S. According to the recent survey by CHIPS (the Clearing House Interbank Payments System) and Fedwire, more than 80% of the volume of all corporate payment is still made with cheque, despite the fact that most companies use both cheques and wire transfers.<sup>17</sup> Experiences of this kind point to the need to be more cautious in the use of pricing policy alone in the move towards the changing of consumer choice.

Like many other countries, the term structure of payment fees has been used as part of the driving factors influencing the use of different types of payment instruments. For Thailand's case, changing the structure of payment fees was seen as a means towards the growing reliance on the use of e-payment instruments. However, the surveyed results seem to provide little support for this claim.

In contrast to such the increasing trends in the use of e-payment services, the use of some sort of paper-based payment instruments has shown sign of declining trends. This is particularly so for the case of cheque usage which recorded a reduction of around 3% in the first ten month of this year compared with the same period of last year. The increase in the fee of cheque usage from 5 to 15 Baht in early March this year has been seen as the major factor attributing to such the declining in the use of cheque. Such a reduction in the cheque usage tends to be in line with our "National E-Payment Strategy" which aims to slow down the use of paper-based payment instruments in Thailand's payment system.

### **3.2 Conducting Survey on Payment Choice by Consumers and Businesses**


Identifying the main trends on Payment Choice by Consumers and Businesses is particularly useful from the policy makers' point of view. At least, it would provide valuable information about the factors responsible for the use of different payment instruments (cash and non-cash) in the retail payments system at a micro level. In view of this, in 2006, the BOT made its first attempt to directly survey on payment method and transaction value for certain groups of businesses. The survey was conducted during the fourth quarter of 2006. It comprised the direct interviews with the senior staff and/or executives of the companies taking part in the project. The survey covers 7 groups of businesses: (i) Insurance, (ii) Media, (iii) Retail, (iv) Public Transportation, (v) Education, (vi) Financial Market Transaction, and (vii) Government. The survey is probably one of the first in which Thai businesses were

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<sup>17</sup> For more details of this, see New York and Clearing House Survey (2007).

asked to indicate the nature of paying in cash, by debit card, e-purse and credit card in specific POS situations.<sup>18</sup>

Results of the survey, as summarized in Figure 19, have provided useful information regarding the behavior of businesses in making payments. *First, there tend to be prevalent use of paper cheques and cash by most of the business groups in making payments.* In the case of Insurance Industry, for example, paper-based payment instruments have gained the lion share, both in terms of incoming and outgoing payments. As is evident from the Figure, more than 90% of incoming payments were paper-based payment instruments. Of this amount, around 80% was in the form of cash, while the remaining 18% was cheque. Similar portion can be observed for the case of outgoing expenses. A closer look to figures for other business groups appears to provide similar conclusions to the case of Insurance Industry, though the pace may be of some slight difference.

**Figure 19** 

**Some reflections on payment choice by businesses in Thailand**

Business type	Incoming payments			Outgoing expenses		
	<i>Cheque</i>	<i>e-payment</i>	<i>cash</i>	<i>Cheque</i>	<i>e-payment</i>	<i>cash</i>
• Insurance	18%	2-3%	80%	80%		
• Media	90%	9%	1%	Almost 100%		
• Retail		30%	70%	30%	70%	
• Public Transportation	15%	5%	80%	Around 50%	Around 50%	
• Education			Mainly cash	Mainly cheque		

Source: BOT survey on payment choices by businesses in Thailand.

Note: Figures provided here should be viewed as an indicative.

The finding that cash has still been the king in making retail payments is not totally surprising. As pointed out in many circles (see, for example, Sayan and Rungsun (2003), Taylor (2006)), the persistent reliance on cash as a means of payment can be explained by its unique qualities which, in combination, need to be surpassed by other types of payment instruments. These include, in particular, (i) Convenience, (ii) Liquidity, (iii) Protection of privacy, (iv) Legal tender, (v) Payment finality, (vi) Confidence and acceptance. It is a common practice for most merchants (restaurants) in Thailand that making payments in cash will get a relatively higher discount than those paid by credit cards. As is widely practiced, the discount rate for

<sup>18</sup> The second survey is planned to carry out in 2008. The coverage of the second survey includes the following six sectors: (i) Leasing, (ii) Public Utilities, (iii) Health Care, (iv) Manufacturing, (v) Agriculture, and (vi) Cash Management.

the former is 10% compared to 5% for the latter case. Practice of this kind tends to highlight the importance of “liquidity” as perceived by business sector.

*Second, there seemed to be some evidence indicating that some forms of e-payment products/services, particularly Pre-authorized Direct Credit, have been used extensively by some certain sectors (e.g. Retail Sector).* From the surveyed data, there have been increasing evidences showing that a variety of companies’ expenses have been made via SMART. Although salary expense continued to be the prime item for making payment using SMART, other expense items, rents and reimbursement for hospital claims, have been increasingly paid via this sort of payment channel. It is important to point out in this connection that most of businesses under review tended to show that credit transfer via SMART system has become increasingly popular as major payment instrument for making payments for salary.

*Third, as claimed by most businesses under survey, both price factor and non-price factor have been cited as factors attributing to the low degree of substitution of paper-based payments by e-payment instruments.* The most cited factors for non-price factors are (i) lack of acceptance in the use of e-receipts or e-documents as legal evidence by relevant Government agencies such as the Revenue Department, (ii) low degree of interoperability, especially it cannot be cross-used among each service providers, (iii) low degree of common standards on technology and security, (iv) relatively well-established legal framework for the use of cheques, (v) security concern, especially those related to the frauds problem, (vi) network instability.

The factors mentioned above have been often cited as obstructers related to using e-payments. The relatively lower fees for cheque in relation to e-fees were viewed as the price factor contributing for the lower use of e-payments. Relatively lower cost for the use of cash and paper cheque has often been cited as one of the major factors attributing to a higher use of paper-based payments instruments. This seems to be the case even when the fees on cheque have been adjusted upward as indicated in Figure 16. As has been claimed in many circles, the recent introduction of new structure of payment fees may have provided an unclear signal for certain groups of people. Examples in this regard include the upward adjustment of fees operating via SMART system from 10 baht to 12 baht for transaction amount less than 100,000 baht.

*Fourth, cash also gained prominent shares in some certain sectors such as Public Transportation and Education.* Although cash is the most traditional means to discharge an obligation, the surveyed results show that the businesses involved offer their customers also the possibility to pay using non-cash payment instruments. Indeed, the finding that cash is still being the king in making retail payment by market participants seems to be consistent with the overall macro picture of the country. As one can see, the cash usage in relation to GDP for Thailand’s case was found to be in

the range of 8.16-9.22% in the years 2000-2006<sup>19</sup>, compared with those of 3-4% for advanced economies. As pointed out in Rungsun and Sayan (2005), the degree of cash usage for Thailand tended to be relatively high, compared with certain groups of countries, particularly those in the advanced economies. The relatively high degree of cash-to-GDP ratio and extensive withdrawals from ATM can be argued as major factors contributing to such a well-entrenched use of cash. This suggests that, like many other countries, cash remains an important payments instrument in Thailand.

However, care should be extremely taken when comparing the degree of cash usage among countries participating in the SEACEN research project. For instance, having widely recognized as the cash-based economy, the cash-to-GDP ratio for Cambodia was reported to be only around 3-4%. This tended to be much lower when compared with those in many other SEACEN member countries including Thailand, Korea, and Taiwan, to name but a few. Nonetheless, a closer look at the figure on cash-to-GDP ratio indicated that the figure on cash has not incorporated cash usage in US dollar term. As widely known, there has been widespread use of US dollar in making daily payments in Cambodia. According to the estimates by the National Bank of Cambodia, the use of US dollar in making daily payments constituted for more than 85% of the total supply cash circulation.

*Fifth, there tend to be no symmetry between the structure of incoming income and outgoing expenses among the business sectors under review.* According to the evidence from Figure 18, it is likely that the use of different types of payment media may not necessarily be in line with the corresponding of incoming income and outgoing expenses. As one can see from the pattern of incoming income and outgoing expenses of some certain types of business sectors, the Public Transportation tended to have received cash for more than 80% of the total incoming payments. But, on the other side of its balance sheet, this business sector made the outgoing expenses in the form of cheques and e-payments for an approximately equal portion of 50%. This reflects in part the fund management by the Public Transportation sector. It follows that the financial authorities appeared to have adopted some sort of payment instruments for making payments, depending on what they sees fit to the overall framework of the fund management.<sup>20</sup>

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<sup>19</sup> The ratio of cash-to-GDP dropped significantly to 8.35% in 2006, compared with those of 9.00%-9.22% during the years 2002-2004. While such a decline tends to provide positive implications for the strategic move towards the reduction of cash usage as put forward in the Payment Systems Roadmap 2010, it seems to be too early to make a clear conclusion about the change in the choice of payment method for consumers and businesses.

<sup>20</sup> The view along this line has been shared by Dr. A. G. Karunasena, the Executive Director of the SEACEN Centre, during the Workshop arranged by the SEACEN Centre in Kuala Lumpur on December 13-14, 2007. As pointed by Karunasena, similar observations to the case of the Public Transportation in Thailand can be made in the case of “Octopus Card” in Hong Kong.

### 3.3 Setting up the New Payment Gateway Services (Thailand National ITMX)

It has been widely accepted that the establishment of efficient payment infrastructure would contribute significantly to the move toward a more efficient payment systems of the country in question. This would, in turn, lead to the greater contribution of the successful development of the country's economic performance. As in many other countries, discussion on the issue of the setting up of e-payment gateway has long been received increasing attention from BOT's policy makers responsible for the conduct and implementation of payment system policy as well as from leading personals in Thailand's payment industries.

Although the e-payment systems provided by the BOT, as mentioned in Section 2, have been viewed as important gateways in inter-bank connections, the Payment Systems Committee (PSC) has found it necessary to further develop e-payment platforms that can fully serve all activities relating to e-commerce and make sure that the system is complied with the BIS Core Principle.<sup>21</sup> The establishment of ITMX is viewed as a promising starting point in this regard. Indeed, the establishment of national ITMX can be also seen as an attempt on the part of the Thai authorities to move away from taking a "direct operational role" to performing a newly designated role as regulators of the country's payment systems. It has become crystal clear that some forms of payment services will be no longer under the direct operation by the BOT in the foreseeable future. This is particularly so for the SMART system which has been transferred and operated by national ITMX since October 2007.

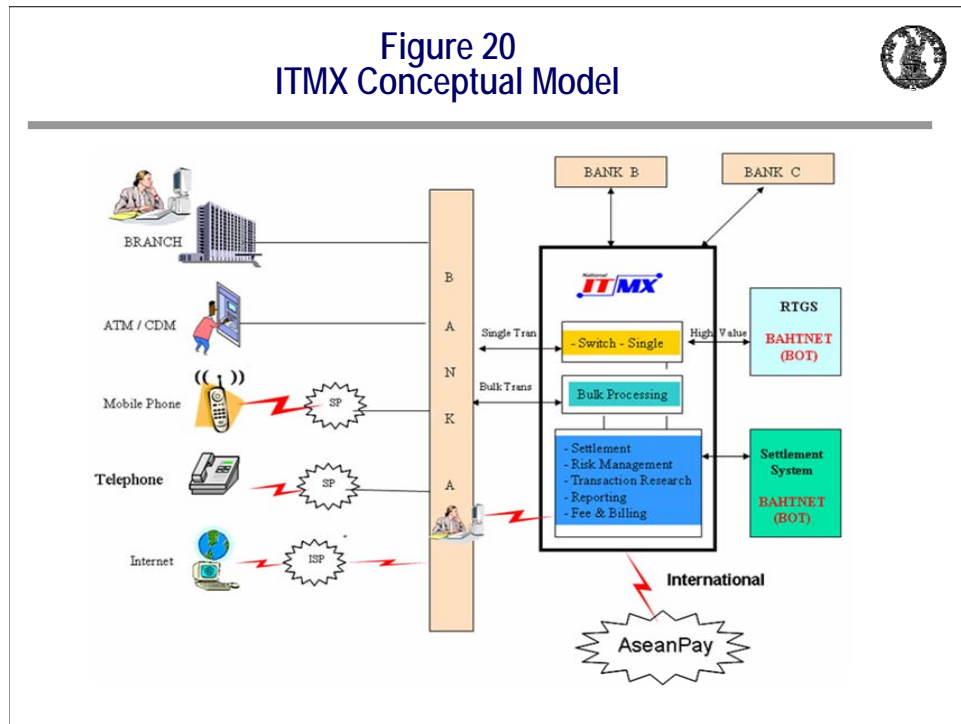
As characterized from Figure 20, the ITMX would provide e-payment services to business, individuals and local and international banks using IT infrastructure, so that they could do business using e-payment systems and mobile phones. Services to be available in the ITMX system would include ATM, SMART Credit, SMART Debit, Direct Credit, Direct Debit, ORFT via ATM, inter-bank counter funds transfer service via ATM, and services via e-channels such as the Internet and mobile phones.<sup>22</sup>

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<sup>21</sup> The PSC was established in 2001 to supervise policy issues concerning payment systems of the country, considered significant matters comparable to monetary policy of the whole nation. PSC also stipulated that local financial institutions dispatch some experts to represent in the committee, which, in turn, signaled a start of concerted effort to engineer the uniform payment systems to enhance effectiveness of national economy in general.

<sup>22</sup> Essentially, the system is required to operate with high efficiency, together with convenience, swiftness and safety. Apart from these, the operating cost is required to maintain at an appropriate level, reducing duplicated investment among member banks. In addition, it will promote expansion of electronic commerce of country, in accordance with a key policy of the PSC. It will greatly facilitate consumers in using payment services of all banks all over the country, 24 hours a day, when the company fully operates in 2007. National ITMX Co., Ltd. has been registered since July 2005. Currently, it has completed the selection process of solution vendors for inter-bank funds transfer and payment services.





Specifically, the setting up of Thailand national ITMX is intended to serve *multiple purposes*. For one thing, it is intended to facilitate electronic payment transactions and conduct business in accordance with the framework and policies of the central bank and the supervision of the bank's payment system committee. For another, it will be served as a switching centre for business and payment transactions, both business-to-business and business-to-customers. Apart from these, the national ITMX will allow easy electronic transfer of money by business. It will instill confidence in companies and those in the private sector wanting to conduct business over the network. It is expected that Thailand will be in a better position to provide excellent services for consumers, especially when the national ITMX commences its full operation in the period around early 2008 onwards.

More importantly, the setting up of Thailand national ITMX has paved the way for the ease of regional fund transfers among countries in ASEAN. Over the past many years, with the continued support from the BOT, the ITMX has been working in collaboration with the switching network in other three member countries, including Indonesia, Malaysia, and Singapore, to set up ATM regional linkage that facilitates cross-border ATM withdrawal arrangements. As one can see from Figure 21, the ITMX has already set up the ATM link with its counterparts in Malaysia (MEPS) since 15 October last year. For the linkages with remaining countries, it is expected to conclude soon. As commonly agreed, the ATM regional linkage has offered convenient services to consumers and corporations among member countries. The first phase of ATM regional linkage system will become more useful to consumers

and corporations among member countries in the near future when this sort of facility enlarges its business coverage to include the interbank fund transfer facility.

<b>Figure 21</b>			
<b>Cross border ATM Linkages with ITMX</b>			
<b>ATM Regional Linkage</b>	<b>Country</b>	<b>No. of Banks</b>	<b>Date in Operation</b>
ITMX – MEPS	Thailand	7	15 October 2006
	Malaysia	2	
ITMX – NETS	Thailand	-	In discussion
	Singapore	-	
ITMX – <u>Artajasa</u>	Thailand	-	In discussion
	Indonesia	-	

### **3.4 Facilitating and Fostering Changes in Legal and Regulatory Framework**

Similar to the experience of many countries in the SEACEN region, there is no explicit legislation on payment and settlement systems in Thailand. Although there are laws and regulations which empower the BOT to play as a regulator and to handle with the crucial problems incurred in the country's payment systems. In this vein (as mentioned elsewhere), the various areas of payment and settlement systems are governed by a number of separate laws and regulations. The principal pieces of legislation governing the country's payment and settlement systems can be summarized as follows:

- (1) *The Bank of Thailand Act of 1942*, stipulating the role of the central bank in the payment system and issuing the regulations and guidelines for its payment services;
- (2) *The Commercial Banking Act of 1962*, empowering the BOT to directly supervise Thai commercial banks and local foreign bank branches;
- (3) *The Currency Act of 1958*, concerning currency operation;
- (4) *The Civil and Commercial Code*, being referred to for other financial papers that are used as means of payments (the Law relating to legal instruments, Contracts, and Obligations);
- (5) *The Securities and Exchange Act of 1992*, supervising the primary and secondary market of the country's capital market;
- (6) *The Electronic Transactions Act of 2001*, giving the legal recognition of electronic data message;
- (7) *The Bankruptcy Act of 1940*, governing the entire insolvency and bankruptcy aspects;
- (8) Consumer Protection Law.

The lack of specific law pertaining specifically to the payment system means that payment transactions fall under the Civil and Commercial Code. However, the BOT and other concerned government agencies are well aware of the rapid pace of

development in ICT, and hence the need to ensure that legal framework stands ready to cope with such a rapid ICT development.

The following are the recent legal framework developments for payment and settlement systems in Thailand that are regulation amendment, proposing or drafting the new explicit legislations.

- (1) *Amendment to the BOT Act*, empowering the BOT to regulate and support the establishment of clearing and settlement systems across financial institutions and/or payment systems. However, this approach may take a very long time on the process, pending to be approved by the parliament.
- (2) *The draft of Financial Institution Act*, being currently under the BOT board review. The act empowers the BOT to propose a royal decree to regulate businesses that pertain to deposit taking from the public, credit extension, or other financial businesses. This will be another legislation pertaining to the payment and settlement systems.
- (3) *The enactment of subsidiary laws, royal decree, rules and regulations derived from the Electronic Transactions Act*. This may empower the BOT to spread its authority to oversee the operations of private payment systems, particularly payment services operated by non-bank firms. The decree is still under the consideration process. To illustrate, if the BOT stipulates the regulations on oversight of the payment systems, electronic money or new means of making payments, it is required to propose a Royal Decree under the Section 32 of the Electronic Transactions Act 2001.

As alluded to in the previous sections, although the pace of e-payment usage has been less aggressive, evidence so far suggests that there tends to have a gradual upward adjustment in the use of e-payment in the near future. It is likely that not only commercial banks are taking part in offering variety of services in retail payment markets, but also non-banks are increasingly interested in providing competitive services for consumers and businesses. Under these changing retail payment landscapes, it appears that the existing legal and regulatory framework has not kept pace with the new environment.

As a regulator and catalyst of the country's payment system, the BOT has found it increasingly difficult to handle with such changing retail payment landscapes. Enormous endeavor has been used to foster the introduction of new law governing the payment system. Reflecting this, effort has been made to formalize the acceptance of e-receipts by market participants, along with the push towards the promulgation of the Royal Decree Regulating E-payment Service Business.<sup>23</sup> At present, the law is under

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<sup>23</sup> E-payment businesses covered in this law are defined to include (i) Credit Card Network service, (ii) EDC service, (iii) Transaction Switching service for payment in one system, (iv) E-money service used for purchasing specific goods or services as specified in advance at the place which has been in the same system for distribution or providing service, (v) Clearing service, (vi) Settlement service, (vii)

the process of enacting by the Cabinet and is expected to be enacted in 2008. It is expected that the BOT will be in a better position to take initiative role in promoting development and usage of e-payment according to this law.

As mentioned earlier, in Thailand, e-money can be issued by either banks or non-bank firms. However, they are regulated under the different laws. For the e-money issued by banks, it falls under the Commercial Banking Act B.E. 2505 Section 9. As for the e-money issued by non-banks, the issuer must comply with the Ministry of Finance Notification, which came in force on October 4, 2004. (Ministerial Notification, Ministry of Finance: Business for which Permissions must be obtained according to Clause 5 of Announcement of the Notification Executive Council No.58 dated October 4, 2004).

Evidences so far appear to show diverse experiences among countries in SEACEN region with respect to the nature and evolution of the country's legislation on payment and settlement systems. As one can see, some certain countries in SEACEN region have already put in place explicit legislation on payment and settlement systems. For instance, Malaysia has put forward Payment System Act (PSA) in 2003. The law has empowered Bank Negara Malaysia (BNM) to set out a comprehensive regulatory oversight framework to govern the rapidly changing payment landscape. The law also recognizes BNM as the sole authority responsible for the oversight of payment system in Malaysia. This is to ensure the safety and efficiency of the payment systems infrastructure, and to safeguard public interest.

#### **IV. Concluding Remarks and Future Direction of E-payments**

Evidences provided in this country's paper tend to suggest that there have been an increasing use of e-payment in Thailand over the past decade or so, as reflected in part to the substantial increase in the value and volume of financial transactions via the payment services of the BOT. As already pointed out, every form of e-payment services operated by the BOT has shown a remarkably upward trend over the past decade, particularly those of BAHTNET and SMART systems. As shown earlier, the volume of transactions for BAHTNET and SMART systems has respectively increased nearly 3 times and 7 times in the period 2000-2006. Significant increase in the use of other e-payment channels offered by commercial banks and non-banks can also be seen for the cases of ORFT, apart from the growing popularity of more "traditional" e-payment types. As the volume shown makes clear, traditional e-payments, including debit cards, credit cards, and credit transfers, have become increasingly important components of the Thai payment systems over the past many years. The share of debit cards and credit cards alone accounted for nearly 70% of the total volume of non-cash payments in 2006.

Evidences so far tend to suggest that e-payment development in Thailand has shown a promising development, although the pace of the development has yet to become materialized. As pointed in the paper, necessary e-payment infrastructures have consistently introduced by the BOT in order to putting in place certain important infrastructure needed for the smooth functioning for the entire payment and financial systems of the country. Particular importance in this regard included the establishment of the national ITMX and the promulgation of the Electronic Transaction Act of 2001.

Parallel to the development of e-payment system by the BOT, continuous endeavor has been made to encourage a growing use of some sort of e-payment products for making retail payments. The sharp rise in the use of new service of ORFT has been regarded as highly successful for the case of Thailand, as reflected from the more than *ten-fold* increase in the volume of transactions over the past seven years. As alluded to in the text, convenience in use, suiting for consumers' need, and relatively low costs on the part of service providers have been seen as important characteristics for this successful story.

Preliminary evidence indicates that consumers and businesses have given the major weight in some "non-price factors" in the process of making choice for using different types of payment instruments. As implied from the recent business survey, concern over the legal acceptance on e-receipt and e-document has resulted in the delayed acceptance for the use of some form of e-payment products or services, especially those related to fund transfers via SMART service. Evidence of this kind tends to suggest that care needs to be given in placing too much emphasis on the use of "pricing factor" alone in shifting the preference of consumers and businesses towards the greater use of e-payment products.

Similar to experiences in many countries in the SEACEN region, the impact of e-payment on the operation of monetary policy has *not* yet produced any sort of serious concern on the part of the Thai monetary authority. This is partly because the relatively minimal size of the e-money transactions when compared with the money

supply. Likewise, the overall adverse impact of growing e-payment usage on the conduct and implementation of monetary policy has yet to become materialized.

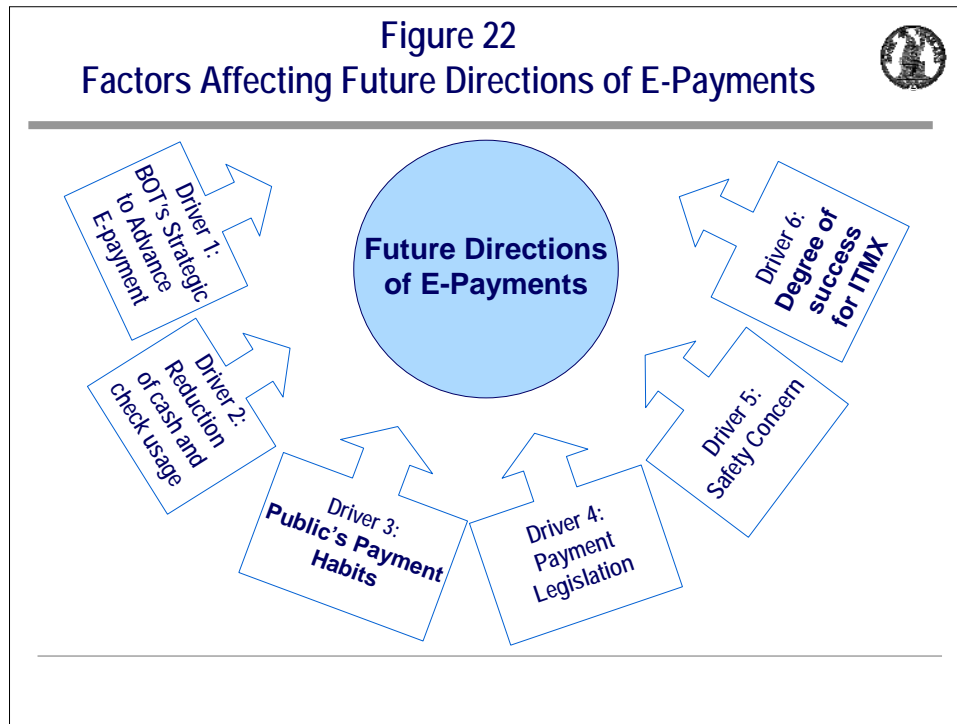
In a similar vein, the impact of e-payment has *not yet* posed any apparent threat for the stability of the country's financial system. However, given the potential risk involved, the Thai monetary authorities find it useful to track of such developments in the applications of recent innovation in e-payment instruments/products, and to formulate regulatory framework to ensure safety and efficiency of the payment system. A closer look at the experiences of other central banks in the SEACEN region has provided similar conclusions to the Thai case, though the pace of policy response may be of some difference, reflecting in part to the difference in the country's e-payment developments and the degree of e-payment penetration. As documented in the Country's Reports, the impact of e-payment has not yet posed any apparent threat for monetary authorities in these countries in influencing short-term interest rates.

Experience has shown that the use of pricing policy alone may have not been aggressive enough in encouraging greater adoption of e-payment products. This is mainly because consumers and businesses tend to have given relatively higher weight to certain types of "non-price" factors, including in particular the legal support for the use of e-receipt and e-document, the difficulties involved in the use of new e-payment products. The move towards the wider use of the more cost-effective electronic payment products or services, from the perspective of service providers, may have become feasible if the provision or introduction of e-payment products/services in question has a high potential to reach critical mass.

The results of the surveyed study tend to show that while the use of paper based payment instruments, cash and cheque, has been affected by the growing use of electronic alternatives, the volume and value of cash usage have continued unabated. The analysis tended to provide insights into businesses' payment habits and their perceptions of cash and its alternatives. The surveyed results appeared to show that the businesses' decision-making process concerning payment choice is quite complex. Potentially, the results of the survey tend to highlight several "non-price" features that contribute to the unpopularity of e-payment instruments, especially those related to uncertainty over security, standards, and compatibility issues.

Preliminary evidence seems to suggest that recent introduction of the newly payment gateway service of National ITMX appears to be a major mover for an increasing use of e-payment products. Looking into the prospects over short and long time horizons, it is likely that this new type of gateway service would, to some degree, give rise to the overall reduction of the operating costs of participating commercial banks in offering payment services. This would in turn help increase the overall efficiency of the country's payments system. The analysis also suggests that the upcoming promulgation of the Royal Decree Regulating E-payment Service Business, apart from the existing of Electronic Transaction Act of 2001, would help enhance the confidence of market participants towards greater use of e-payment products/services.

It is perhaps useful to briefly discuss the likely factors affecting future direction of e-payments in the period ahead. The discussion, as shown in Figure 22, can be grouped under the following *six* headings.



*The first concerns the BOT's strategic to advance e-payments.* Like many central banks in the region, especially Bank of Korea and Bank Negara Malaysia, the BOT is involved in efforts to migrate the country to e-payments, which are currently in their infancy stage when compared with those in advanced economies. The Bank has recently initiated a number of projects to create a conducive environment to foster the orderly transition to e-payment. As reflected in the Payment Systems Roadmap 2010, the Bank has set up plans to encourage the increased use of e-payments by major market participants, including in particular individual customer, businesses, government agencies. Further efforts are under way to channel and coordinate industry efforts to migrate to e-payments.

*The second concerns the BOT's strategic move towards the reduction of cash and check usage in the near future.* The BOT has approved a guideline for payment fees setting among commercial banks to reflect actual costs of services, and promote greater use of electronic media, with reduction in use of cheque and cash usage. The new payment fee structure among commercial banks has been in place since March 2006. The use of fee structure has, in fact, been successful in many countries, moving the whole economy to increasingly rely on electronic payment systems. While such a successful experience will be the case for Thailand is open to debate, evidences reported in Section 3.2 tend to indicate that pricing factor alone may have limited influences over the choice of public's choice unless it has been bolstered, or at least supported, by decidedly necessary non-price factors. Apart from the newly approved fee structure, it remains to be seen as to whether, and to what extent, the setting up of Thailand National ITMX would contribute to a reduction of cash and check usage in the period ahead.

It is important to note, however, that one should not ignore the dimension of past history when judging the potential pace of acceptance of future payment methods or the realization of the intended effects of new payments technologies. Experiences in many countries have shown that it typically takes some time to shift the public's payment preference/habits from the use of relatively more traditional form of paper-based products to the relatively new forms of e-payment instruments in making payments. For example, in the case of the United States, it took at least a quarter of a century for the share of e-payment instruments/services (e.g. debit and credit payment cards) to surpass that of paper-based payment instruments.<sup>24</sup> This tends to suggest that greater efforts need to be carried out in the move towards the successful reduction of cash and cheque usage of the country.

*The third is related to public's payment habits.* As reflected from the surveyed results, there tend to be several *non-price* features that contribute to the unpopularity of electronic payment instruments. As discussed in Section 3, most businesses still preferred to use paper-based payment instruments to e-payments. Cheque and cash in particular have still gained the lion share in the overall incoming income and outgoing expenses. It follows that it is not quite easy for the authorities concerned to change the habits and/or behaviour of consumers to a greater use of e-payment services/products. In addition, merchants might not be willing to e-payment for fear of the increased service charges. Apart from these, there are additional concerns regarding system interoperability concern, IT security concern, to name but a few. The use of pricing policy alone to encourage the shift towards the increased use of e-payment products may have not become materialized unless concerted actions are taken to improve the conditions of related non-price factors.

It is worth pointing out that some other central banks have also encountered with similar experiences to the BOT. As documented in the paper by Chang (2007), inducing changes in the public's habits towards the greater use of e-payments has been considered to be quite difficult tasks in the context of Taiwan. According to Chang, changing the payment habits of the consumers and businesses tends to take a long time to become materialized. For one thing, consumers who are familiar with the use of traditional payment media, e.g. cash and cheques, may find it not easy to change their habits to the use of e-payment instruments/services. For another, merchants who prefer cash revenue might not be willing to accept e-money for fear of the accompanying service charges. As has been widely practiced, a large portion of restaurants in Thailand tends to give a higher discount rate to their customers when paying by cash. For illustration, the discount rate is 10% for paying by cash. The discount is reduced to 5% in case restaurants' clients prefer to pay by credit card.

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<sup>24</sup> This happened for the first time in the year 2003. According to the Federal Reserve Board (2004), the share of paper-based payment instruments (cash, consumer checks, commercial checks, official checks, traveler checks, and money orders) declined from around 85% of the total non-cash payments in 1979 to 78% in 1995. The share further declined to 58% in 2000 and 45% in 2003. The share of e-payments, by contrast, recorded the rising trends over the same period. It increased from 15% of the total non-cash payments in 1979 to 22% in 1995. It increased further to 42% in 2000 and 55% in 2003.



***The fourth concerns the pack of changes in the country's legal and regulatory framework related to the payment system.*** As is commonly agreed, a sound legal and regulatory framework is vital for the move towards a growing use of e-payment and e-money. The lack of specific laws pertaining specifically to e-payment and e-money has incurred implicit costs to all participants. Like many central banks, the BOT and other concerned government agencies are well aware of the rapid pace of development in ICT and in e-payment developments. The financial authorities in Thailand have over the past many years put forward changes in laws and regulatory framework governing e-payments. This is to ensure that the legal framework stands ready to cope with such a growing introduction of e-payment developments.

The recent proposal of the Royal Decree Regulating E-payment Business is a good reflection for this. According to this decree, any person who intends to provide e-payment services, which include e-money, will be subject to prior notification, regulation or license. However, the law has been pending in the parliament for approval. The enactment of the law, as it can be argued, will not only strengthen the oversight power of the authorities, but also promote the reliability of e-payment and consumer's confidence. Additionally, the lack of law governing the use of e-receipts and e-documents has resulted in the slow adoption for the use of e-payments by market participants. Plan is now under way to encourage the wider acceptance of e-receipts by working closely with the Revenue Department.<sup>25</sup>

It should be pointed out in this connection that the upcoming promulgation of the Bank of Thailand Act of 2008 would provide an additional channel for the Thai authorities to exert significant influences over the pace of the country's e-payment developments. According to this newly-introduced law, the traditional consultative mechanisms under the so-called "Payment System Committee" (PSC) are legally formalized. It is expected that the BOT, through the PSC, would be in a better position to lay down necessary measures/guidelines to ensure that certain types of "attractive features" for the use of e-payment mechanisms for making payments has been adequately put in place.

***The fifth is related to safety concern by market participants.*** Similar to the experiences in other countries in the SEACEN region, significant portion of market participants in the e-payment related businesses has expressed concern over the issue of safety in using e-payments. In the view's point of consumers, e-money related activities are transferred through a cybernetic system which may have encountered with several challenges arising from internal and external threats. Among these include counterfeiting, tampering, hacker attacking, personal data leaked or stolen, especially bank account number and PIN.

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<sup>25</sup> For reference, see "The Electronic Signatures in Electronic Commerce Law". The law, issued on 14 November 2001, aims to give legal validity of electronic documents, and endow electronic media the equal legal status with those of paper-based media.

***The sixth aspect deals with challenges of creating net benefits for the use or the introduction of prospective e-payment products.*** To address barriers to the use of e-payments, the BOT has recently initiated a series of strategic action plans to help create a conducive environment to foster the move towards the increased use of e-payments. Plan is now under way to encourage the greater use of e-payment by business and government sectors. The major aims of the BOT 3-year plan for the years 2007-2009 are to: (i) encourage a greater use of e-payment by government and business sectors; (ii) gain more acceptances of e-payment transactions as legal-accepted evidence by Revenue Department; (iii) put in place the system of inter-bank bulk payment (debit transfer);(iv) strengthen standard on information exchange in case of bulk payment. As the plan involves active participants from various sectors, ranging from commercial banks, industrial body, consumers, businesses, government agencies, it may have to take time before it becomes materialized.

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