



**Working Paper 2004-01**

**Payment Systems Group**

**February, 2004**

**The Use of Cash, Cheque and  
Electronic Payment Services in Thailand:  
Changes and Challenges for Efficiency Enhancement**

*Prepared by*

*Sayan Pariwat and Rungsun Hataiseree\**

---

\* Prepared initially for Payment Systems Group Workshop at the Bank of Thailand (August 19, 2003). We are grateful for helpful comments from participants of the Bank of Thailand Payment Systems Group Workshop. The authors wish to thank Harry Lienonen, Advisor to the Board of the Bank of Finland, and his colleagues for valuable comments and useful suggestions on earlier drafts. The authors are respectively Senior Director and Team Executive of Payment Systems Group, Bank of Thailand. The views expressed in this paper are those of the authors and do not necessarily represent those of the Bank of Thailand or Bank of Thailand policy. Please address all correspondences to Rungsun Hataiseree, Payment Systems Group, Bank of Thailand, 273 Samsen Rd., Pranakhon, Bangkok 10200, Thailand. Tel: +66(0) 2283-5102; Fax: +66(0) 2282-7717. E-mail: [rungsunh@bot.or.th](mailto:rungsunh@bot.or.th).

**The Use of Cash, Cheque and  
Electronic Payment Services in Thailand:  
Changes and Challenges for Efficiency Enhancement\***

*Sayan Pariwat*

*Rungsun Hataiseree*

*Payment Systems Group*

## **1. Introduction**

Retail payment system, like large-value payment system, has been evolving over time, although not dramatically. As one can see, there has been a trend toward the shift of using payment instrument from paper-based instruments, in particular cheque and cash, to electronic-based instruments in many countries. The move toward the greater use of electronic payments has been in part encouraged by existing evidence showing that the overall cost of an electronic payment tends to be in the range of around one-third to one-half from that of a paper-based transaction. As pointed out in the paper by Humphrey *et al.* (1996), the total cost of paper-based payment in the case of the United States is estimated to be around \$2.93, compared with \$1.31 in the case of electronic payment. This suggest that the overall costs (payer, payee, and bank) for electronic payments are estimated to be around 40 to 55% less than a comparable cheque payment.

Despite such trend, it is interesting to see why cheque payment has still played the most prominent role in retail payment markets in some certain countries such as the United States, Canada, Australia, Thailand and a few European countries. However, the relative importance of

---

\* Prepared initially for Payment Systems Group Workshop at the Bank of Thailand (August 19, 2003). We are grateful for helpful comments from participants of the Bank of Thailand Payment Systems Group Workshop. The authors wish to thank Harry Lienonen, Advisor to the Board of the Bank of Finland, and his colleagues for valuable comments and useful suggestions on earlier drafts. We also would like to thank Vattana Passarakul for helpful preparation of the graphs for use in this study. The views expressed are those of the authors and do not necessarily reflect those of the Bank of Thailand.

non-cash transactions in these countries has continued to show sign of declining trend over the past two decades. In the US case, the proportion of checks written compared with the total number of non-cash payments has actually declined from about 80 per cent in 1990 to around 70 percent in 1999. The picture seems to be more pronounced in the case of Australia, as the proportion of check payments has steadily declined from around 85 per cent to around 30 per cent of the number of non-cash payments over the past three years.

Despite such a declining proportion of the check payments, checks continue to be the most widely used retail payment instrument after currency in many countries, including Thailand. This seems to be particularly so when some forms of electronic payments (e-payments), e.g. credit and debit cards, electronic fund transfers, electronic purse (e-purse) or e-money, are viewed to be not well suited for meeting the needs of consumer and business. Indeed, the stage of development for these relatively new types of electronic payments instruments tends to be not too high in most emerging economies, compared with those in industrialized countries. In this environment, the fact that cheques are still widely used suggest either that cheques are an efficient means of payment for many purposes relative to alternatives or that barriers to innovation are inhibiting the development of alternatives.

As for Thailand's case, according to the BOT (2000) study on "Payment Systems Pricing and Usage", the following 4 aspects need to be addressed to gain long-term achievements of more competition and efficiency in the retail payments system. These include (1) adjustments to the present structure of the fees for different payment instruments, (2) improvement in the system of "Online Retail Funds Transfer" (ORFT), (3) putting in place additional law and regulations relevant to the electronic payments, and (4) upgrading the users' understanding on the electronic payment usage.

At this stage, it seems likely that there is still open solution for the type of method for use to encourage the greater use of electronic payments and the enhancement of efficiency in the retail payments system. Cheque truncation and electronic pricing have been another option that has been widely used in Germany to overcome the barriers to the use of electronic payments,

while direct pricing strategy for payment instruments has been widely employed by central banks in many countries, particularly those in Norway, Netherlands, Finland, to help enhance more efficiency in the use of different types of instruments in retail transactions (Humphrey, 2000; Norge Bank Bulletin, 2002).

The launching of the check truncation project in this year's February by the BOT, apart from the putting in place of Electronic Cheque Clearing System (ECS) in 1996, and the greater use of the check truncation in the form of Bill for Collection (B/C) 3 day system have been seen as attempts on the part of the BOT to reduce existing impediments to the use of electronics in check processing in greater details. The increased use of this new type of cheque processing, as will be discussed in more detail later, can contribute to an improvement of the long-run efficiency of the Thai retail payments system due in part to its relatively higher speed with which the payments are proceeded.

Although the existing of an appropriate structure of fees for different types of payment instruments is seen as a major factor contributing to a more efficient retail payment system, experiences in overseas countries suggest that adjustments to the structure of fees charged by financial institutions for pricing cheque and electronic payment services alone may be in some certain cases insufficient to help shape the structure of retail payment instruments to achieve the long-run efficient payment system (Humphrey, *et al.* 1996). In other words, it is argued that upward adjustment to the fee for cheque writing, for example, may be part of the solution aiming to achieve a more efficient retail payment system. As pointed out in the recent report of BIS (2003), other considerations that shape the choice of payment method for consumers and businesses need to be taken into account to gain achievement of efficient retail payment system. These include:

- (i) the convenience offered and the reliability and security of the payment method; the quality of service, covering such features as the speed with which payment are processed;
- (ii) the structure and level of fee charged by financial institutions providing financial services;
- (iii) taste and demographics;

(iv) technological advances which have improved the speed, convenience and flexibility of different payment methods. Experience from Australia's case suggests that technological advances and price signals facing the users have been a significant influence on the changing payment landscape in Australia over recent years.

As the costs of using electronic payment instruments have been found to be lower than the paper-based instruments, there has been a tendency to shift to the use of a relatively more cost effective type of payment instruments in many countries. Although central banks in many countries have given more emphasis on "electronic check collection" and "electronic check truncation and presentment", experiences in many countries have showed that it has been very difficult for banking industry to move from a paper-based to an electronic check collection system, and to electronic payments.<sup>1</sup> In this regard, it is interesting to see whether, and to what extent, such a changing payment landscape toward the greater use of electronic payments in many industrialized countries is of particularly successful to the case of retail payment system in Thailand.

Although at this stage, cheque payments continue to constitute to a major portion of retail payment in Thailand accounting for more than 85% of the total value of non-cash payments, there is a tendency that other forms of retail payment instruments, such as electronic payments, which are claimed to be relatively more cost-effective products, may have become more increasingly used in the near future. The fact that cheque payments remain an important part of the payment culture in Thailand may be claimed to be associated with a number of factors, including in particular the user costs efficiency (including convenience costs), responsiveness to user demands, and innovativeness in instrument design and service delivery. The BOT, like many other central banks, has to pursue strategies that ensure achievement of the Bank's core missions

---

<sup>1</sup> In the United States, for example, there has been experimentation with check truncation and electronic presentment in the United States since the 1960s with limited success. However, the banking industry has recently shown renewed interest in this topic. It has endorsed the goal of having their member present at least 50 percent of their checks electronically by 2001. The Federal Reserve Banks present about 20 percent of their checks electronically to more than 3,800 banking organizations. Both the Federal Reserve and the private sector are piloting new arrangements for truncation, presentment, and digital image.

(Pariwat and Hataiseree, 2003). In view of the central bank role, the BOT strategic focus is on the overall efficiency, accessibility, and integrity of the Thai payment system. As a service provider, the Bank needs to provide cost effective and innovative products that meet the evolving needs of financial institutions and ultimately of businesses and consumers.

This study aims to identify the main trends in the use of cash and non-cash in the retail payments system and analyze the likely implications for “*efficiency*” (and “*safety*”) in this market for the case of Thailand. It also discusses a number of initiatives undertaken by the BOT to foster the move towards a more efficient retail payment system and explores ways to encourage the medium-term and long-term efficiency of the Thai retail payment systems in the period ahead. In other words, the paper tries to shed some light on the issue of *public intervention policy* to gain more efficiency in the retail payment systems in Thailand. The paper is structured as follows:

- the *next section* describe retail payment system in Thailand, compare it to retail payments systems of some selected countries, and document the preponderance of cash usage and cheque writing on the part of Thailand. It is intended to shed some light on the factors influencing payment instrument choice in those countries under review to see whether there are similarities or differences with respect to factors influencing choice of payment instrument.

- the *third section* describes recent trends and development in the use of different types of retail payment instruments (ie. cheques, cash, and electronic payment instruments) in Thailand and present, in a basic demand/supply framework, some of the factors that might help explain these trends. As will be discussed in more details later, the size of the markets for each type of retail payments instruments have important implications on future strategies undertaken by the BOT to foster the improvement of a more efficient retail payments system. The section also discusses a set of potential barriers to consumers’ demanding and banks’ supplying electronic payments in the case of Thailand and other countries. It aims to see why there has been a slow shift towards the use of electronic payments in some countries, despite the existing of relative lower cost of transactions for electronic payments.

As will be discussed in more details later, the reasons for the slow adoption of electronic payments has been claimed to lie on the *demand side* rather than the *cost side* as has been often referred to. A number of important trends emerge from the analysis in this section. These include in particular:

- (1) the continuing use of cash (and cheque) as important means of retail payment instruments for point-of-sale transactions and bill payment;
- (2) the continuing popularity of cheque as major means of retail payment instruments;
- (3) the slow shift from cheque (and cash) towards electronic means of payments such as credit/debit cards, “Off Line Retail Fund Transfer” (ORFT);
- (4) the gradual changes in market arrangements for retail payment instruments and services, especially with respect to service providers and pricing.

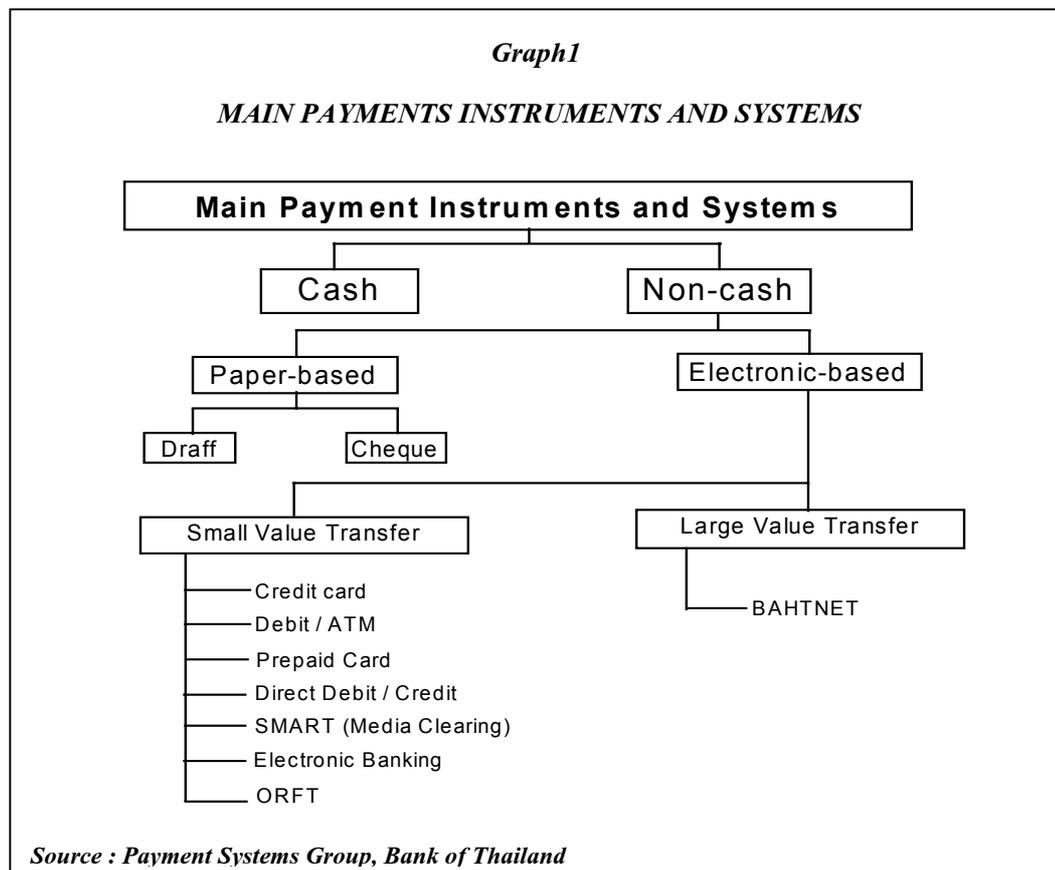
- the *fourth section* discusses the role of the BOT, as participant (provider of retail payment services) and as regulator, in encouraging and fostering more efficiency in the retail payment system. It also discusses what might be done to encourage the long-term efficiency of the retail payment systems in Thailand in the period ahead. These include: (1) encouraging the exploitation of new technologies to improve the efficiency of cheque collection, (2) fostering the use of cost-based pricing for payment services, (3) fostering the exploitation of economies of scale and network externalities, (4) encouraging innovation in retail payment instruments with an aim to increase customer access options.

- the *final section* concludes with policy implications for the enhancement of efficiency in the Thai retail payments system.

## 2. Overview of the Thai retail payment system and some salient features

### 2.1 The structure and composition of Thailand's retail payment

Retail payment system in Thailand depends on both cash and non-cash payments. Cash, in the form of banknote and coins, is issued by the central bank, while non-cash payment services are usually provided by the banking system. This latter type of non-cash payment services, as characterized in Graph 1, can be broadly divided into two groups: (1) *Paper-based instruments* such as cheque and cash, and (2) *Electronic payment instruments*, including in particular (i) credit card, (ii) debit card, (iii) ATMs, (iii) Pre-authorize under the SMART system, (iv) direct debit/credit, (v) ORFT, (vi) payment under BAHTNET. Although payment under BAHTNET can be viewed as one form of electronic payment services, its use has been mostly associated with large-value transactions. As such, one needs to be cautious in treating BAHTNET as means of payment for retail transactions.



As in other countries, the shape and pace of development in the use of different types of retail payment instruments in Thailand over the past decade has been influenced by a number of factors both demand and supply actors. Major *demand factors*, as will be discussed in more details later, include changes in relative prices risk and convenience for existing instruments and increases in general acceptability of newer instruments. Major *supply factors*, on the other hand, can be attributed to the development of new IT and regulatory changes. The former in turn can have an influence on the unit costs of different types of retail payment instruments.

Before going into detail, it is perhaps more useful to start first with some broad figures on Thailand's retail payments in the years 2001-2002. First, *the use of cash in retail payment in Thailand seems to be of particularly high when compared with those found in many countries*. As portrayed in Panel a) of Graph 2, cash holdings for Thailand's case are of 9% of GDP in 2002, while the percentages are 7, 8, and 13%, respectively, for Malaysia, Singapore, and Japan.<sup>2</sup> However, relatively lower cash-to-GDP ratios can be seen in the case of the United States, some European countries (such as Norway, Finland, the U.K.) and Australia. Similar conclusions can be obtained from the use of cash-to-M2 ratio as an indicator of cash usage. As seen in Panel b) of Graph 2, the percentage of cash holdings relative to M2 are about 9%, 9%, 7%, 10%, and 9%, respectively, for Thailand, Indonesia, Singapore, Japan,, and the United States.

However, as shown in Panel c) of Graph 2, the use of cash-to-M1 ratio as indicator for cash intensity for Thailand seems to provide conflicting results from those using cash-to-GDP ratio and cash-to-M2 ratio as indicator for cash use. It seems likely that cash-to-M1 ratio tended to overstate the degree of cash usage in Thailand. This may in part due to the fact that commercial in Thailand are not subjected to pay interest to the holders of M1 assets. Apart from this, the holding of portion of M1 may be linked to store of value purpose, instead of transaction purpose. So, people tend to minimize the holding of M1 assets especially in the face of rising interest rates in the money markets. Moreover, it is quite convenient for the bank account holders in Thailand

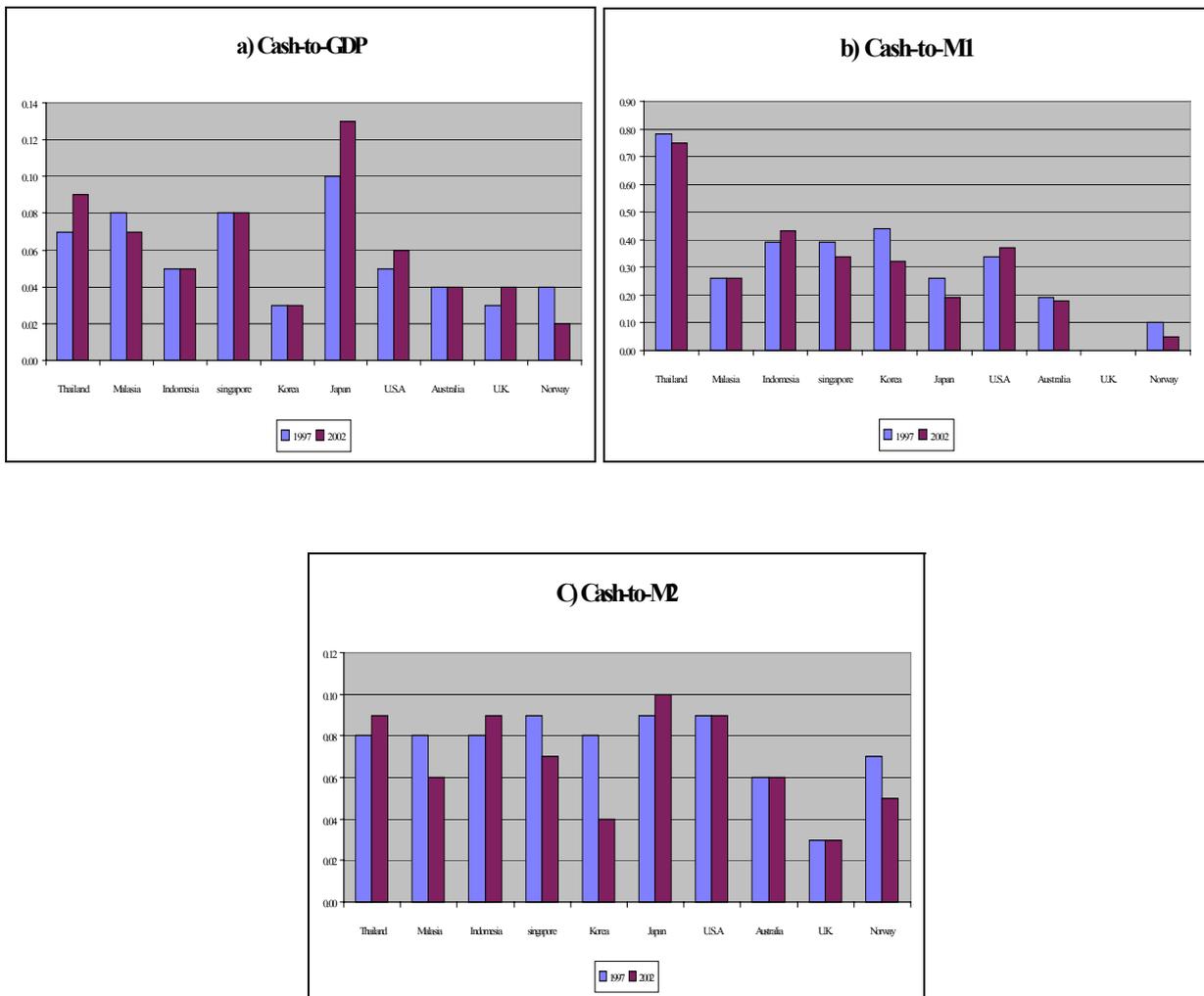
---

<sup>2</sup> Due to a lack of data on cash use in transactions (a flow), cash use across countries is alternatively inferred from the value of cash holdings (a stock) relative to the GDP.

to shift a significant portion of their liquid assets between M1 and M2 depending in part on the movement of the market interest rates and in part on the pattern of fund usage of the bank' clients. As such, figures on M1 tend to vary considerably especially at times when there have been noticeable changes in the market interest rates. In view of this, one needs to be extremely cautious when using cash-to-M1 ratio as indicator for cash intensity for Thailand.

**Graph 2**

**Indicators of cash usage: A cross-country comparison**



Source: Own estimates based on data from IFS (various issues).

The difference in cash use across countries seen in Graph 2 can be related to a number of factors. For one thing, the difference tends to relate to the difference in the public's demand to hold cash for transactions, precautionary, and speculative (hoarding) purposes. These demands are also affected by the extent of illegal activities, including the avoidance of taxes, the level of crime rate, across countries. The relatively low crime rates in Japan and most of Europe, as it had been argued, make it more safe for customers and retailers to rely more on cash as the means of retail payment (Humphrey *et al.* 2001). This seems to be the major reason contributing to the exceptionally high ratio of cash usage in Japan.

For another, it may reflect that debit card payments, which are considered to be close substitutes for cash, have not yet become popular for use in small-value retail payments in many countries with heavy reliance on cash use. As one can see, the ratio of cash holdings in European countries known for their relative emphasis on card-based payments tends to be relatively low. The ratio is about 2-4% for the case of Norway where debit card accounted for about 30% of non-cash transactions. The use of debit card in retail payment in Thailand, as will be discussed in more detail in subsequent sections, has not received much attention from the users to initiate small-value retail payments. The share of debit card payment in the total value of non-cash retail payment in Thailand has been reported to be of negligible amount of less than 1%. The evidence reported above appears to be in line with the earlier study of Boeschoten (1991) and Boeschoten (1992) which found that the availability of credit and debit cards and their terminals tends to reduce the cash use.

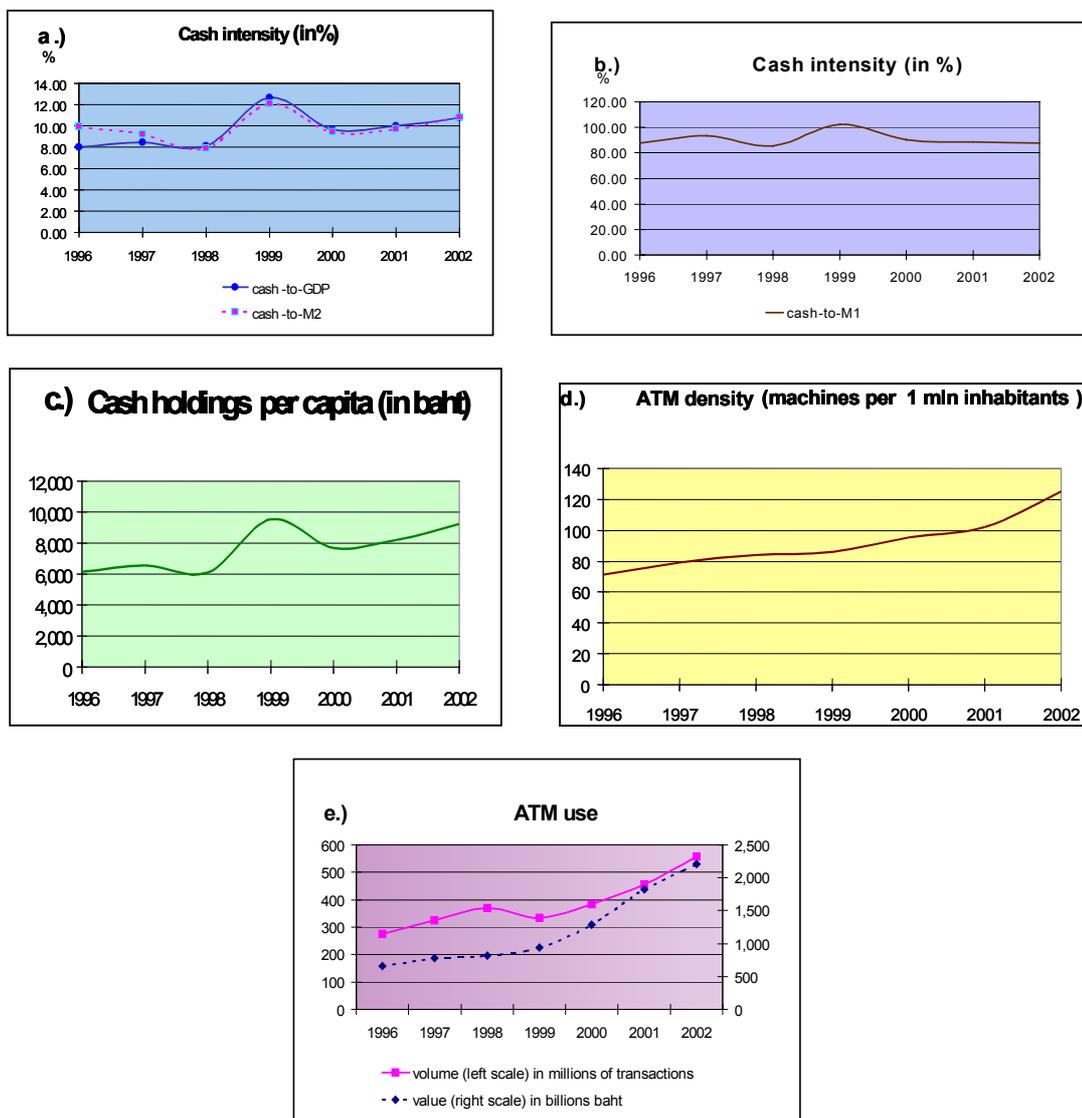
Apart from these, the continuing popularity of cash in retail payments has been claimed to be associated with the absence of credit risk, the anonymity associated with many of these transactions, and its immediacy and finality in transactions. The existence of the extensive ATM networks in Thailand may also contribute to lower costs and greater convenience in obtaining cash, as well as lower costs of supplying cash at traditional banking locations.

As is evident from Panel d) and e) of Graph 3, there has been an increase in ATM density and ATM use. As one can see, the number of ATMs per one million of inhabitants has steadily

been rising from 71.3% in 1996 to 125.1% in 2002, an approximate increase of 84%. The number of cash withdrawals through ATMs has also displayed an increasing trend. In 2002, an average number of cash withdrawals through ATMs by a Thai inhabitant has been estimated to be around 8.9, an increase of around 93% when compared with an average number of 4.6 in 1996. Such an upward trend of cash usage via ATMs appeared to be consistent with the behavior of cash holdings of the people. As shown in figures in Graph 3, cash holdings have been steadily increased from around 6,100 baht in 1996 to 9,000 baht in 2002

**Graph 3**

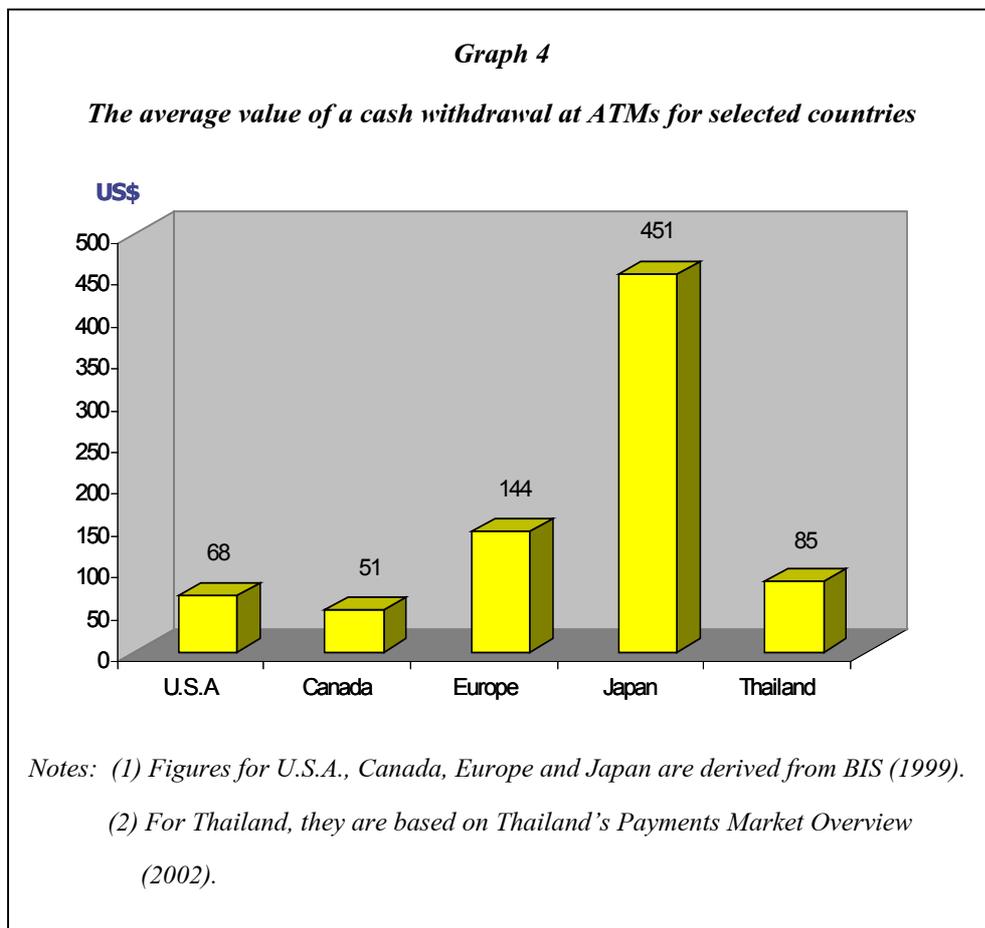
***The use of cash and ATM payment in Thailand***



Source: Derived from data reported in Thailand's Payment Market Overview (2002).

Second, as is characterized in Graph 2, *the ratio of the stock of cash in the hand of the public in Thailand tend to show sign of an upward trend over the years 1997-2002*, increasing from around 7 percent of GDP in 1996 to about 9 percent of GDP in 2002. Such an increased in the ratio of cash-to-GDP for Thailand can be in part supported by the noting that the average value of an ATM transaction displayed an upward trend, rising from around 2,388 baht in 1996 to 3,355 baht in 2000, and 3,961 baht in 2002. It is important to note, however, that, apart from Japan, the ratio of cash-to-GDP in the period 1997-2002 also displayed an upward trend for U.S.A. and the U.K. that have been regarded as cheque-based countries.

Recent study by Humphrey *et al.* (2001) suggest that countries with heavy reliance on cash for a large share of their transactions tend to have a relatively higher average value of a cash withdrawal at these countries' ATMs. The average value of a cash withdrawal at these countries' ATMs, as portrayed in Graph 4, is reported to be \$68, \$51, \$144, and \$451 for the United States, Canada, Europe, and Japan. In dollar term, the average value of a cash withdrawal from ATMs for Thailand is estimated to be around \$85 over the years 1996-2002.



Third, the cash transactions, as proxied by ATM withdrawals, tend to show sign of an upward trend.<sup>3</sup> As one can see from Table 1, the annual withdrawals from ATMs were in the range of 234-286 billions baht for the years 2001-2002, while the combined value of payments made by credit cards and direct debit/credit were in the range of 2,823-3,122 billions baht for the same period. It has become apparent that the value of cash withdrawals from ATMs is far exceeded, when compared with the value of payments made by credit cards alone. Evidence of this kind indicates that cash still outstrips this traditional method of electronic payment instrument.

Fourth, the cash holdings per capita have also displayed a remarkably rising trend. As one can see from Panel c) of Graph 3, the average value of cash holdings per capita increased sharply from around 6,100 baht in 1996 to around 9,000 baht in 2002. Evidence of this kind tended to lend support to the notion that cash transaction has shown of an upward trend.

**Table 1a : Number and value of retail non-cash payments in Thailand for the years 2000 and 2002**

Type of payment	2000				2002			
	Number		Value		Number		Value	
	(thousands)	Percent of total	THB billions	Percent of total	(thousands)	Percent of total	THB billions	Percent of total
<b>Cheque (inter-bank)</b>	<b>72,059</b>	<b>16%</b>	<b>26,949</b>	<b>29%</b>	<b>78,717</b>	<b>12%</b>	<b>18,799</b>	<b>21%</b>
<b>Electronic payment</b>	<b>388,350</b>	<b>84%</b>	<b>65,903</b>	<b>71%</b>	<b>566,114</b>	<b>88%</b>	<b>69,880</b>	<b>79%</b>
-Credit card	na	0%	178	0%	na	0%	301	0%
-ATMs	383,599	83%	1,287	1%	557,949	87%	2,210	2%
-Pre-authorized under the SMART system (credit transfer)	4,107	1%	121	0%	7,362	1%	274	0%
-Payment under BAHTNET	644	0%	64,317	69%	803	0%	67,095	76%
<b>Total</b>	<b>460,409</b>	<b>100%</b>	<b>92,852</b>	<b>100%</b>	<b>644,831</b>	<b>100%</b>	<b>88,679</b>	<b>100%</b>

Source : Payment Systems Group, Bank of Thailand

<sup>3</sup> It is worth noting that this sort of ATM withdrawals does not necessarily measure the total value of cash transactions because a single currency note can be used many times before being returned to a financial institution. However, this indicator seems to provide a lower bound of the total value of cash transactions

Type of payment	2000				2002			
	Number		Value		Number		Value	
	(thousands)	Percent of total	THB billions	Percent of total	(thousands)	Percent of total	THB billions	Percent of total
<b>Cheque (inter-bank)</b>	<b>72,059</b>	<b>16%</b>	<b>26,949</b>	<b>94%</b>	<b>78,717</b>	<b>12%</b>	<b>18,799</b>	<b>87%</b>
<b>Retail Electronic payment</b>	<b>387,706</b>	<b>84%</b>	<b>1,586</b>	<b>6%</b>	<b>565,311</b>	<b>88%</b>	<b>2,785</b>	<b>13%</b>
-Credit card	na	0%	178	1%	na	0%	301	0%
-ATMs	383,599	83%	1,287	5%	557,949	87%	2,210	10%
-Pre-authorized under the SMART system (credit transfer)	4,107	1%	121	0%	7,362	1%	274	1%
<b>Total</b>	<b>459,765</b>	<b>100%</b>	<b>28,535</b>	<b>100%</b>	<b>644,028</b>	<b>100%</b>	<b>21,584</b>	<b>100%</b>

Note : Figures shown in this table excludes figures on payment under BAHTNET

Source : Payment Systems Group, Bank of Thailand

Similar to the system in many countries, the retail payment in Thailand can be broadly classified into 2 groups: *cheque-based payment instruments* which has been a popular mean of payment for a long time as the most frequently used non-cash mean of payment and *electronic-based payment instruments*, including in particular (1) credit card, (2) ATMs, (3) Pre-authorize under the SMART system, (4) direct debit/credit, and (5) payment under BAHTNET. As portrayed in Table 1 and 2, cheque continues to be an important payment method in Thailand. As one can see, the share of cheque in the non-cash retail payment gained a relatively much higher share than electronic payments instruments, accounting for around 87% and 94% of the total value of non-cash retail payment in the years 2000 and 2002, respectively. Similar pattern to Thailand's case can be seen in the case of United States and Korea (Table 2).

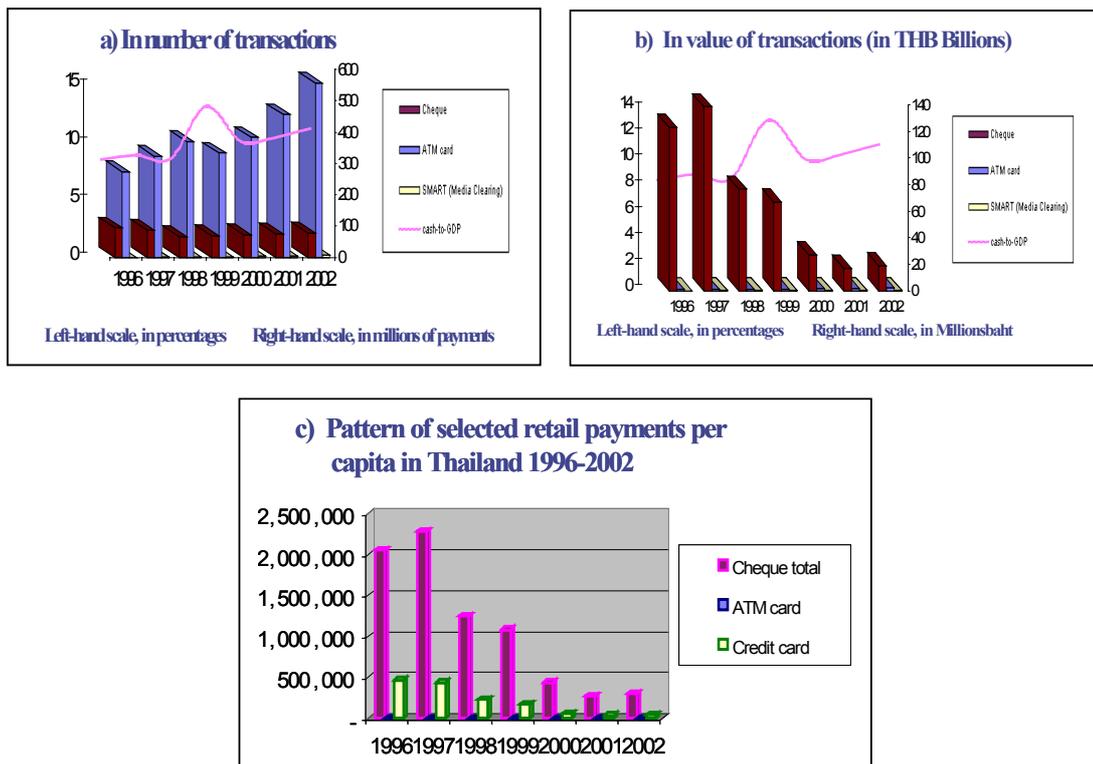
<b>Table 2</b>			
<b>Electronic transaction and Paper-based transaction: A Cross-country comparison</b>			
	<b>U.S.A.</b>	<b>Korea</b>	<b>Thailand</b>
	(Trillions of dollar)	(Billions of won)	(Billions of baht)
<b>Paper-based payments</b>	<b>39.3</b> <b>(84.4%)</b>	<b>5,864,413</b> <b>(70.0%)</b>	<b>18,799</b> <b>(87%)</b>
● Check clearing	39.3	5,804,003	18,799
● Paper-based Giros (e.g. Paper-based credit transfers)	--	60,410	--
<b>Retail Electronic payments</b>	<b>7.3</b> <b>(15.6%)</b>	<b>2,511,139</b> <b>(30.0%)</b>	<b>2,785</b> <b>(13%)</b>
● Debit card	0.3	--	--
● Credit card	1.3	--	--
● Retail ACH	5.7	--	--
● Electronic Giros	--	--	--
● ATMs	--	--	2,210
● Pre-authorized under the SMART system (credit transfer)	--	--	274 (1%)
● CD, and Electronic Banking	--	--	--
● EFT/POS, CMS	--	--	--
<b>Total</b>	<b>46.6</b> <b>(100%)</b>	<b>8,375,552</b> <b>(100%)</b>	<b>21,584</b> <b>(100%)</b>

Note: Data for United States are for 2000; for Korea 2001; for Thailand 2002

However, in terms of number, cheques constituted the much lower share. As one can see from Graph 5 the number of cheques accounted for around 16% in 2000 and 12% in 2002, while electronic payment instruments, in particular ATMs, gained a relatively much higher share, amounting to an approximate share of 84% and 88% over the same period. In addition, as implied from figures in Table 1, the average value of cheque written in 2000 and 2002 was considerably greater than the average value of credit and debit card payments.

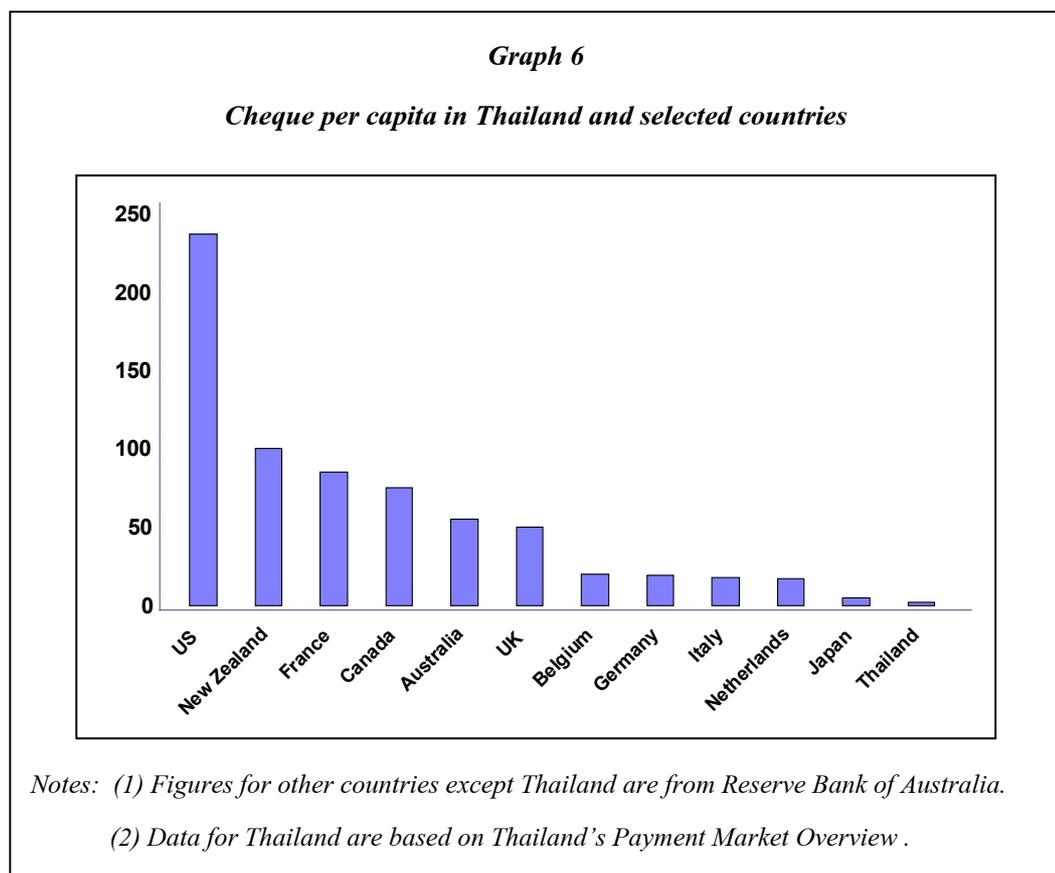
**Graph 5**

**Use of Thai retail payment instruments in 1996-2002: Classified by the number and value of transactions**



Source: Derived from Thailand's Payment Market Overview (2002).

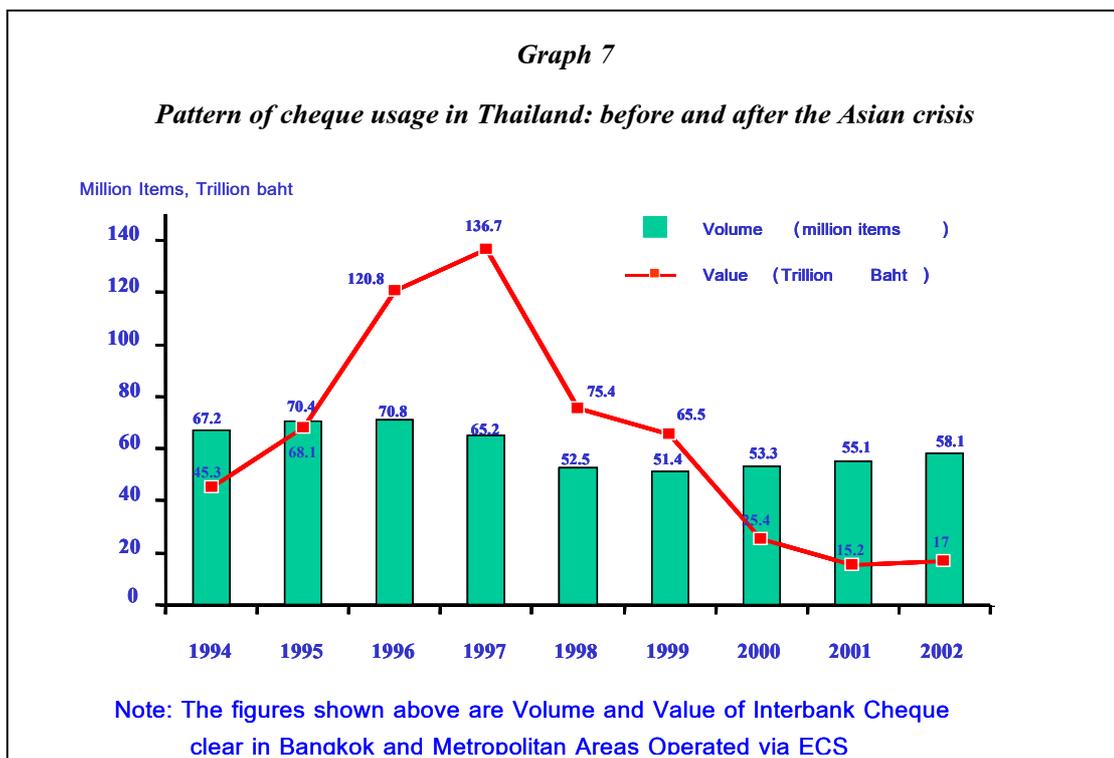
As pointed out earlier, the ratio of cheque in the total value of non-cash retail payment has been found to be high in value term, accounting for the lion share of over 80% in the period 2001-2002. However, the level of cheque usage in Thailand tends to be reasonably low if one considers in terms of the number of cheques written per capita. As shown in Graph 6, Thailand relative to other advanced countries, seems to be at the lowest end of the spectrum in terms of cheque usage. It has an average of 1.5 cheques per capita each year while the United States still has a payment system dominated by cheques with an average of 237 cheques per capita each year.



A closer look at the figures of cheque usage for Thailand's case over the past decade has entailed a number of important features. *First, growth in the use of cheque still showed sign of an upward trend over the past many years.* It recorded an increase of 12 percent in 2002 compared with 2001. Such an upward increase in the growth of cheque has been at the expense of electronic payments that recorded the decline of around 2 percent during the same period.

Second, as is evident from Graph 7, it appears that the value of cheque paid in the case of Thailand tended to decline sharply in the period after the Asian financial crisis in 1997. It declined from the peak value of around 137.7 trillion baht in 1997 to around 75.4 trillion baht in 1998. The value of cheque paid continued to show sign of a declining trend in the years 1999-2002. Sharp drop in the value of cheque paid had become more pronounced in the year 2001 at time when financial transactions for the high value cheque payments were encouraged to execute via the BAHTNET system. However, it is important to note that the lowering in the value of cheque paid in Thailand appears to have been related to the slowdown in economic activity in the aftermath of the Asian crisis in 1997 rather than to a gradual shift to the use of electronic payment.

It is important to note also that unlike the pattern of cheque use in Bangkok and its vicinity, the popularity of cheque use in the provincial areas has still remained high. As pointed out elsewhere, the value of cheque use has been found to show sign of an upward trend in the period after the crisis, increasing from the value of 252,220 million baht in the third quarter of 1998 to around 399,938 million baht in the first quarter of 2001.



*The use of cheque and implications for competition and efficiency.* The fact that cheque has been a predominant type of payment in Thailand has raised a number of public interest issues regarding to competition and efficiency in Thailand. Evidence of this kind coupled with the recent improvement to the cheque clearing system has raised a number of public interest issues regarding to competition and efficiency in Thailand.

For one thing, it may reflect that the pricing by banks tends not to reflect the relatively high costs of processing for this sort of payment instrument. It has been claimed the divergent trends toward the use of cheque payment instrument seems to be in part linked to the structure of fees charged by financial institutions. As has been claimed in many circles, there tend to be under pricing of the cheque usage, as the pricing for electronic instruments tends to be relatively expensive than the paper-based instrument such as cheque.

For another, electronic payment instruments may be viewed not as close substitutes for cheque. Evidence in many countries suggest that the use of cheque tends to have provided additional benefits for the users in terms of a relatively higher degree of control on the part of the users compared with those of electronic payments. As such, one needs to be cautious about the issue of degree of substitution among various types of retail payment instruments.

Despite the relatively lower costs of processing, electronic payments constitute only a fraction of all retail payment transactions in Thailand. The reasons for the slow adoption of electronic payments may lie on the *demand side* rather than the *cost side* as has been often referred to. For one thing, electronic payments may have not well suited for many customers and businesses needs in Thailand. This is because the other instruments are viewed not as close substitutes, but rather as different types of goods, not in direct competition. In either of these situations, there is no market problem for the central bank to solve. For another, it appears that costs of check payments and costs of other non-cash payment instruments tend to be not large

enough to encourage the use of other non-cash payment instruments, when compared with the benefits received from the use of checks.<sup>4</sup>

### *2.3 How the Thai retail payment differ from systems in other countries*

A number of salient features emerge from a closer look at figures in Table 2. First, as characterized in Table 1, it is likely that *cash and cheque still plays a predominant role in making payments in Thailand*. As one can see, the bulk of point-of-sale in retail transactions is largely carried out in cash. Part of reasons for this lies in that cash provides simplicity, anonymity, immediacy and finality. Furthermore, given that cash payments are usually of low value, user costs appear to be relatively low. However, major disadvantages for cash usage lie in risk of theft or loss, difficulties in making large payments, and inconvenience when it is used for remote payments. Apart from these, there are opportunity costs of holding cash that rise with interest rate and inflation.

Despite such a predominant role in making payments in retail payment system, various indicators of cash usage indicate that in Thailand the reliance on cash in point-of-sale payments tend to show sign of an upward trend over the years 1996-2002. The pattern of cash usage can be clearly seen with the help of the two commonly used indicators for cash intensity: the ratios of cash over M1 and cash over GDP, apart from the use of cash withdrawals at ATMs as mentioned earlier.

Second, from the preliminary data, it is likely that *there tends to be a slow shift in the use of electronics in retail payment in Thailand*. In other words, there tends to be a slow reduction in the use of cheque in retail payment instrument in Thailand. As mentioned earlier, cheque has been

---

<sup>4</sup> It is important to note that, most large-value payments for settlement of financial market transactions that were once made by cheque are now made electronically, many using the large-value funds transfer system via BAHTNET, a reduction of more than 61 percent, while the value of fund transfer via the BAHTNET system increased nearly tenfold from an approximate amount of B26,900 million in 1999 to B247,320 million in 2000. A closer look at figures for the years 2001-2002 provides a similar conclusion with respect to the pattern of payment method.

the predominant use in Thailand. However, experience in oversea countries showed that there has been a significant drop in the use of cheques for non-cash transaction since 1990. This trend can also be seen in the case of cheque-based countries such as the United States, Canada, Australia, France, although the degree of reduction may vary from country to country. According to the survey reported in BIS (1999), all the G10 countries and Australia have experienced decline in the relative use of cheques for non-cash transaction. Except in the United States and Australia, payments by cheque have also declined in absolute (value) terms.

In the US case, the proportion of checks written compared to with the total number of non-cash payments has actually declined from about 80 per cent in 1990 to around 70 percent in 1999. The picture seems to be more pronounced in the case of Australia, as the proportion of check payments has steadily declined from around 85 per cent to around 30 per cent of the number of non-cash payments over the past three years.

Although cheque remain the major mean for retail payment in Korea, the share of this sort of payment instrument has shown sign of declining trend in recent years due to the expanded use of *cheque alternatives* such as corporate procurement loans and the electronic account receivable-backed loan. According to the KFTC Annual Report (2001), the share of paper-based payments declined from 51.3 percent in 2000 to 47.3 percent in 2001, while the share of electronic payments increased from 48.7 percent in 2000 to 52.7 percent in 2001.

The declines in the overall cheque value in those countries provide supporting evidence that electronic payments have replaced cheque for at least some types of transactions.<sup>5</sup> As for the U.S. case, the statistical evidence appears to show that electronic payments have increasingly replaced larger-value cheques. As one can see, the estimated value of cheques paid declined from \$50.7 trillion in 1979 to \$39.3 trillion in 2000. It appears that further growth in electronic payments could occur through the replacement of some consumer cheques. In addition, the use of

---

<sup>5</sup> This seems to be the case in Thailand as well. As pointed out in Pariwat and Hataiseree (2002), the introduction of BAHTNET system and the implementation of the measure for large-value cheque migration since March 10, 2000 have resulted in the sharp reduction of the value of cheque payment from around B267,390 million in 1999 to B102,980 in 2000

electronic payments by businesses and government have also shown sign of upward trend since 1979. For instance, an increasing number of businesses have adopted deposit of payroll. The proportion of payroll payments made via direct deposit rather than paper cheque increased from close to zero in 1979 to about 50 percent in 2000.

Apart from these, some businesses in the United States have begun to experiment with programs for converting cheque to electronic payments at point-of-sale locations and for processing of bill payments. Moreover, many businesses are seeking ways to combine electronic payment processing with invoicing, which could reduce the number of cheque payments. The Thai Department of Revenue now has put in place system that enables people to pay personal income tax by electronic payment.

### 3. Development trends and implications on efficiency of the Thai retail payment system

The analysis in the previous section suggests that, among the non-cash payment instruments, cheque has still played a prominent role as major mode of payment in Thailand, accounting for about nearly 90% of the total value of non-cash transactions. Although there has been sign indicating that electronic payment instruments may have gained an increasing importance in recent years, its share in the total value of domestic retail payments seems to be of minimal amount compared with those of cheque instrument. Although there has been little information in the case of Thailand indicating that the costs involved in the use of electronic payment instruments tend to be lower than those of paper-based instruments such as cheque, overseas experience suggest that the overall costs (payor, payee, and bank) for electronic payments in the form of an ACH transfer are estimated to be around 40% to 55% less than a comparable cheque payment. As is evident from Table 3, the total cost of paper-based payment in the case of the United States is estimated to be around \$2.93, compared with \$1.31 in the case of an ACH transfer (Humphrey *et al.*,1996).

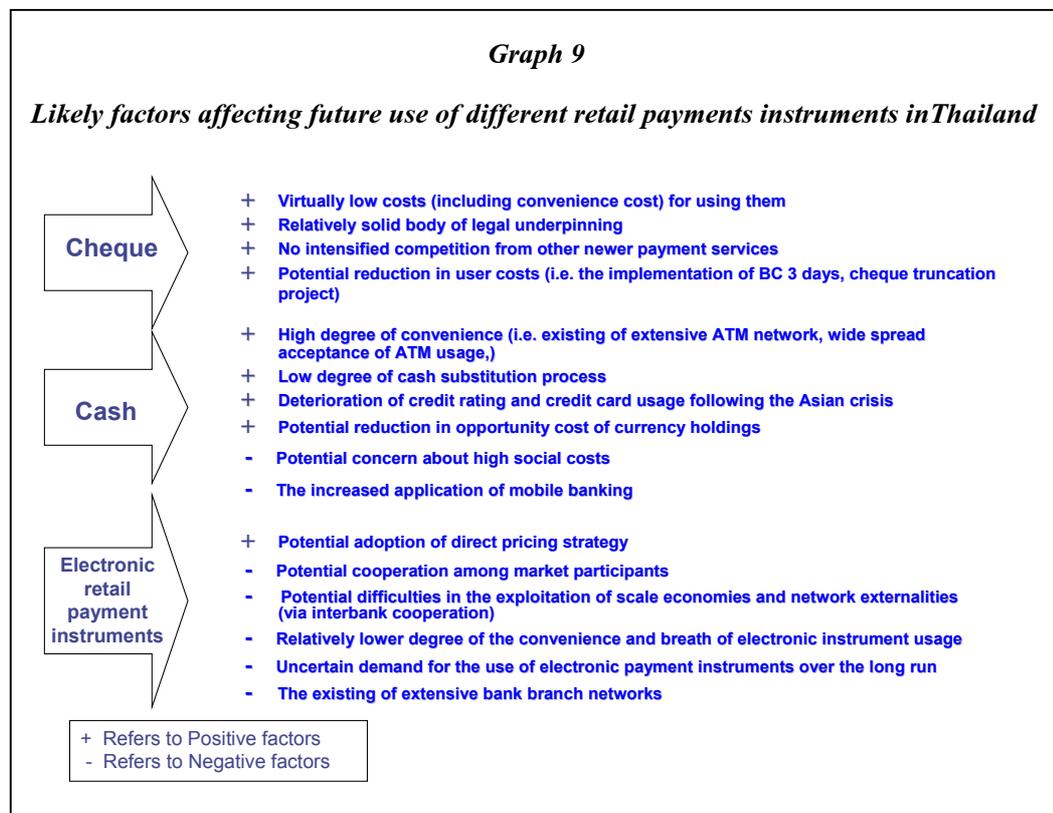
**TABLE 3**  
**PAYOR, PAYEE, AND BANK COST FOR PAPER-BASED AND ELECTRONIC PAYMENTS**  
**(UNTTED STATES, 1993,DORLARS)**

Per Transaction Expenses for:	Paper-based Payment (check)	Electronic Payment(ACH)
Payor	1.39	0.8
Payee	1.25	0.23
Bank	0.29	0.28
<b>Total</b>	<b>2.93</b>	<b>1.31</b>

SOURCE : Wells (1996), using average of range reported for the various components. The reported figures represent weighted average consumer, business, and government payments. Float costs (\$.09) for check have been excluded since float is a transfer payment. Payor of check use are composed of check printing and distribution costs (\$.0345), postage cost (\$.18), and business cost of issuing checks (\$1.) ACH payor cost only include the business cost of initiating a preauthorized direct debit or a direct deposit of payroll (\$.80). Payee costs composed of the cost of accepting a check (\$1.25) at the point-of-sale or for bill payment or the cost (including accounting expenses) of cepting a preauthorized direct ACH debit (\$.23). Bank costs of processing checks and ACH payment (\$.29 and \$.28, respectively include fraud costs and central bank processing and settlement expenses

Against the background and anecdotal evidence discussed in the previous section, it is important in this section to discuss further the trends and developments for the use of various established retail payment instruments, especially cash, cheque, and credit card, in Thailand in the near future. Particular emphasis of the discussion is given to the likely factors affecting the future use of different types of retail payment instruments, as is characterized in Graph 9. For ease of exposition, it is perhaps more convenient to discuss under the following *four* headings:

- Continuing popularity of cheque as major means of retail payment instruments;
- Continuing use of cash as important means of retail payment instruments for point-of-sale transactions and bill payment;
- Slow shift from cheque (and cash) towards electronic non-cash payment instruments;
- Gradual changes in market arrangements for retail payment instruments and services, especially with respect to service providers and pricing.



### *3.1 Continuing popularity of cheque as major means of retail payment instruments*

A number of interesting points emerge from a closer look at the figures in Table 1. First, there has been little change in the share of cheque in the total non-cash payments made using over the recent period. Despite the slightly decreased share, the share of cheque still maintained at the relatively high ratio of 85% of the value of non-cash payments. This seems to reflect that cheques continue to be used to fill a whole range of roles and transfer values in a broad range of situations in the Thai market.<sup>6</sup> The fact that cheque services appeared to be virtually low cost for those using them, and had a solid body of legal underpinning, have enabled them to be more attractive than other modes of non-cash retail payment. This seems to be particularly so especially when one considers in terms of user costs (including convenience costs). In other words, with the risk of oversimplification, it can be argued that costs of check payments and costs of other non-cash payment instruments tend to be not large enough to encourage the use of other non-cash payment instruments, when compared with the benefits received from the use of checks.

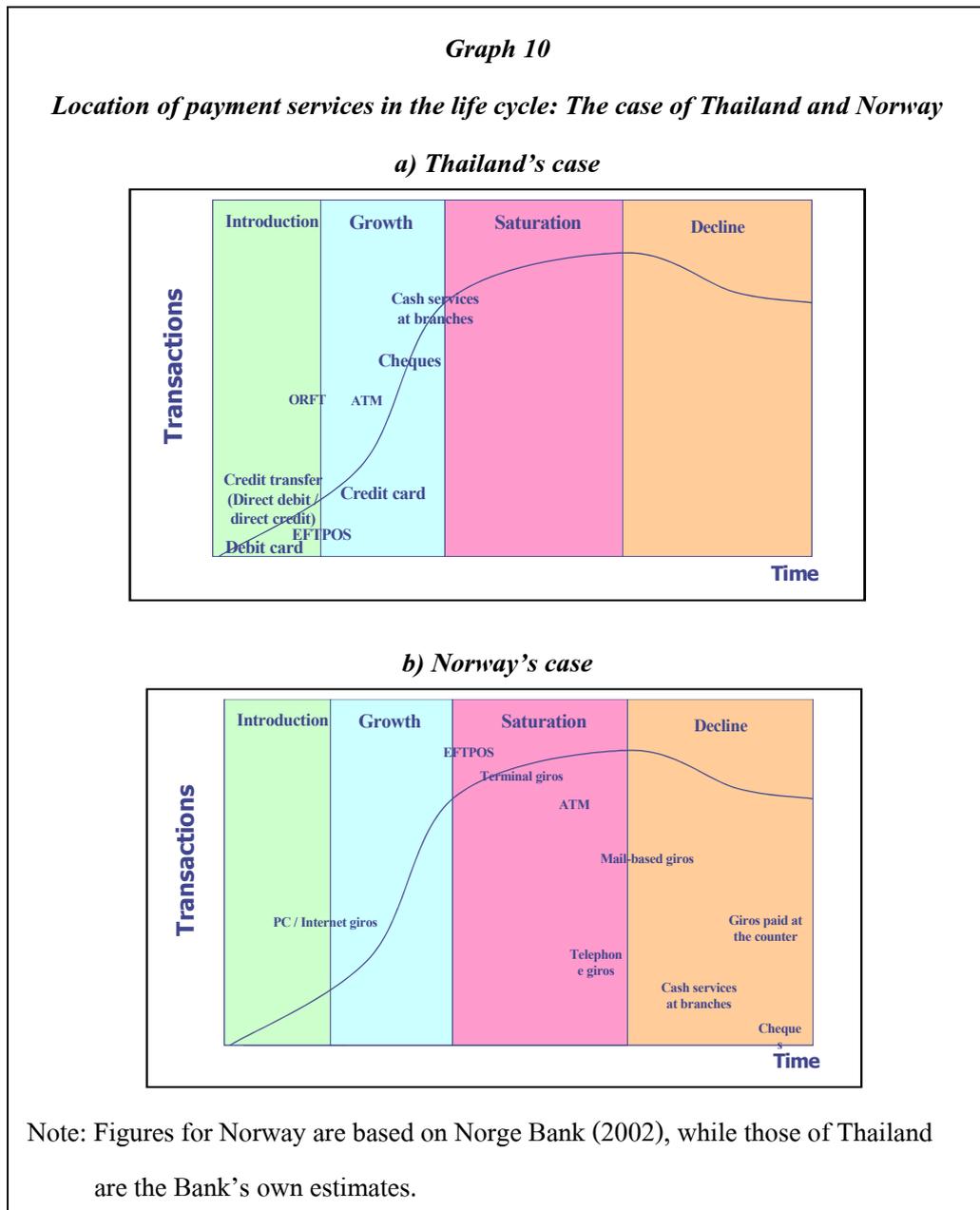
Second, the continuing popularity of cheque usage may reflect the fact that there tends to be no intensified competitions from other newer payment services, especially those of electronic payments instruments. For one thing, as portrayed in Table 1 and Graph 10, credit cards (which is often seen as a sort of traditional type of electronic payment instruments) have not yet become a mature product in Thailand, accounting for only 1% of the total value of payments.<sup>7</sup> For another, direct debit/credit payments continued to account for only 1.9-3.1% of non-cash

---

<sup>6</sup> It should be noted, however, that there has been an actual declining in the value of cheque issued in the period after 1997. Such a decline can be attributed to several reasons. First, it reflects the sharp slowdown in economic activity following the outbreak of financial crisis in 1997 rather than the shift toward the use of new competitive payment instruments such as credit and debit cards. Second, as it has been argued in the recent study by Pariwat and Hataiseree (2002), the decline in the use of cheque as the means of payment in large-value transactions has been in large part encouraged by the BOT measure that requests the financial institutions to rely more on the use of BAHTNET, instead of cheque, in high-value fund transfer among financial institutions.

<sup>7</sup> Graph 10 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.

payments over the years 2000-2002.<sup>8</sup> In a similar vein, the value of retail fund transfer through ORFT system tended to be of a negligible amount of around 38 billion baht in 2002, accounting for only 0.2% when compared with the value of cheque usage over the same period. Apart from these, EFTPOS has not yet emerged as new payment mechanisms in Thailand.



<sup>8</sup> It should be noted, however, that the share of direct debit/credit payments as percentage of non-cash payments tended to increase to around 6.0-12.0% over the same period in the case where the value of transactions via BAHTNET was excluded.

Third, the speeding up of the cheque clearing process from 6 to 3 days, following the implementation of the so-called B/C-3Day project, and the introduction of cheque truncation project tend to have lowered the processing cost for the use of cheques to some certain degree. This in turn tends to lower the overall costs for end-users of cheque. As such, the user costs (including convenience cost) for the use of cheques appear to be relatively lower than some form of electronic payments instruments such as credit cards that has been seen as the most close substitution for cheque in the Thai context. Such the potential reduction of user costs for cheques, along with the low competitions from other traditional and new electronic payment instruments, tends to have a positive outcome on the growth of cheque use in the intermediate future. It is worth noting in this connection that the role of cheque seems to be more pronounced if one looks at data of cheque usage at disaggregate levels. As one can see, cheque usage tends to show an upward trend in the period after the Asian financial crisis in 1997.

All in all, the evidences available so far tend to show that checks seem to be one of the most cost-efficient non-cash payment methods for disbursement transactions, bill payment, and point-of-sale for the case of Thailand due to the following factors:

(1) *those that relate to the degree of substitution.* As discussed, it is likely that cheques and the other instruments are viewed not as close substitutes from the view of end-users, but rather as different types of goods, not in direct competition. In either of these situations, there is no market problem for the central bank to solve; and

(2) *those that reflect the small difference regarding the costs of check payments and costs of other non-cash payment instruments.* Such the cost difference tends to be not large enough to encourage the use of other non-cash payment instruments, when compared with the benefits received from the use of checks. The introduction of the B/C 3 Day project tends to have lowered the cost of processing to some certain degree.

*3.2 Continuing use of cash as important means of retail payment instruments for point-of-sale transactions and bill payment*

As discussed earlier in section 2, *the ratio of cash usage* in Thailand appeared to be relatively high compared with many countries, except Japan. It seems likely that such a high ratio of cash use in retail payments in Thailand tends to have remained at a substantially high level over the course of the years in the period ahead. There are a number of possible reasons for development of this kind. For one thing, the existence of the extensive network for ATMs, coupled with the fact that ATMs has gained widespread acceptance, have made it more convenient for customers to use cash as major means for retail transactions in Thailand, particularly those related to point-of-sale and bill payments. As one can see from Panel e) of Graph 3, cash withdrawals at ATMs, a rough proxy for the cash transactions, have maintained a sharp increase over the years 1996-2002, jumping from the mere value of around 656 billion bath in 1996 to around 2,210 billion bath in 2002. Apart from this, the extensive use of ATMs for withdraw cash instead of using cheque as an over-the-counter instrument for withdrawing cash from bank, as has been widely practiced in some countries like U.S.A., has been seen as an additional factor contributing to the heavy reliance of cash use in the case of Thailand.<sup>9</sup>

Third, *cash substitution process* (measured by the ratio at which other instruments replace cash in payments) may have proceeded with a relatively slow pace. As one can see, persistent use of cash, especially those related to ATM terminals, in retail payments in Thailand and some certain countries may reflect the limited use of some form of alternative retail payment instruments, in particular debit card which is regarded as a close substitute for cash in retail payments. Despite the fact that one can handle a substantial part of his/her regular bills through direct debiting, the use of this mechanism in Thailand has remained of negligible amount compared to many other European countries. As one can see, the respective values of fund

---

<sup>9</sup> However, despite the increasing use of electronic payment instruments and the increased application of new technology, the role of cash seems to be rather strong. Cash has been widely used, especially in small value retail payments, and has not been replaced by new innovations such as electronic money.

transfer using direct debit/credit modes of payments for the years 2000, 2001, and 2002 are about 1,818, 2,589, and 2,836 billions baht, which is about 12% of the value of cash usage in Thailand.<sup>10</sup>

There are a number of factors explaining the small number of direct debits in Thailand. One of possible factors might be that, due to the relative convenience of ATMs, the public has preferred to retain the right to decide on when to pay bills and have thus been reluctant to enter into direct debit agreements, which remove that right. In case of Finland, for example, direct debit has not yet become popular for several possible reasons. One reason might be the abundance of different credit transfer technologies, which enable payment of bills to become more convenient to handle from the office via Internet. Thus, there is no need to visit bank branches in order to pay bill. Another explanation may be that due to the relative convenience of credit transfer technologies in Finland.

However, the picture seems to be not quite so in the case of Canada and Australia. As one can see from Table 4, there was a strong growth in the use of debit card as mode of payments in Canada over the years 1995-1998, rising rapidly from 9% in 1995 to 31% in 1998. Similar pictures can be obtained in the case of Australia. As documented elsewhere, Australia tended to rely extremely on the use of purchases on debit cards and EFTPOS. The use of such services tended to help reduce cash holding costs for some high-cash retailers such as supermarkets.

---

<sup>10</sup> This figure seems to be overstated the underlying figure for the cash substitution process in the Thai context. More correctly, one may need to measure the degree of cash substitution process using the figures of card-based payments (credit cards, charge cards, debit cards, etc) in relation to the use of note and coins. Unfortunately, there seems to be difficult, if not impossible, to have reliable data on the number and value of card-based payments. However, in the case of Thailand, uncertainty about the accuracy and security in the use of debit cards, as it has been claimed, seems to have led to the slow growth in the use of debit cards for retail transactions.

<b>Table 4</b>				
<b>Preferred form of payment in Canada (all purchases)</b>				
	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>
<b>Cash</b>	58%	57%	50%	45%
<b>Credit card</b>	16%	15%	17%	18%
<b>Debit card</b>	9%	17%	22%	31%
<b>Cheque</b>	12%	7%	7%	5%

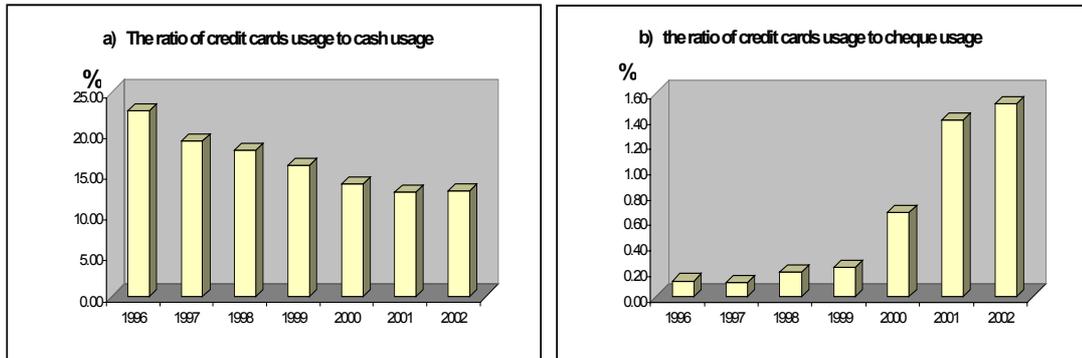
Source: Springer (2000)

Apart from the slow speed in the development of debit card for cash substitution in retail payments, there seems to be little innovation with respect to some new generation of e-purse and micro-payment systems in the Thai market. Although some classes of e-money paper, in particular prepaid cards, have been introduced as additional modes of payments in retail transactions for some time, its share in the total value of non-cash payments seems to be of negligible amount compared with those in industrial countries. Experience in overseas countries suggests that the new generation of e-purse and micro-payment systems intended to substitute for the use of notes and coins, although being negligible at present might be expected to grow in the future.

Fourth, the value of credit cards usage in relation to the use of cash in retail transactions has continued to portray a declining trend over the past decade, despite the continued increase, in absolute term, in the value of credit cards usage over the mentioned period. As shown in Table 1 and Graph 11, the ratio of credit card usage to cash transactions, a rough proxy of cash substitution, has shown sign of a declining trend, dropping from around 22% in 1996 to 16% in 1999. It declined further to around 13.8% in 2000 and around 12.8-12.9% in 2001-2002.

**Graph 11**

***Trend in the use of credit cards in relation to cash and cheque usages  
in the Thai market***



*Source: Own estimates based on data from Thailand's Payment Market Overview (2003).*

Fifth, especially in the period after the crisis in 1997, the severe economic crisis may have exerted a significant impact on the choice of means of retail payments. During the crisis, many consumers ran into financial difficulties, which resulted in payment defaults, deterioration of credit ratings, and decreased use of credit cards. The declining use of credit cards then forced customers to resort to cash to an increasing extent.

Sixth, the fact that cash continues to be seen as an efficient and inexpensive alternative is that the public has been spared the real cost of cash use. That is, the explicit prices charged to customers and merchants for using currency, if any, do not cover the full cost. As such, it is not easy for electronic purses, and other electronic payment systems, to gain ground. Finally, the tendency that domestic interest rates may stay at a historically low level for many years ahead suggests that the opportunity cost of holding cash in terms of interest rate foregone tends to be of particularly low. As an illustration for this, rates paid on saving deposit have recorded a historically low level over the past many years, dropping from around 2 % in 2001 to around 1.5 % in 2002 and 0.75 % in 2003. If this is a case, it may thus lead to larger cash holdings.

Seventh, the persistent use of cash in retail payments compared with alternative retail payment instruments tends to reflect the fact that cash payments have relatively lower values. Overseas experience suggests that the majority of cash payments is below 10 US dollars or its equivalent and account for less than 5% of the total value of payments.<sup>11</sup> All in all, it can be inferred from the above discussion that the choice of using cash as means of retail payment tended to have governed not only by institutional differences among countries, but also the average value of the transaction (and the relatively higher level of user costs for using cash).<sup>12</sup>

Eight, on the contrary, recent innovation in technology, particularly the increased application of mobile banking, would help enhance the level of convenience in fund transfers and in payments for a variety of services. The resultant effect of the increased application of mobile banking would contribute to the lowering of the use of cash in retail transactions.

It is important to note in this connection that the continuous use of cash in retail transactions in Thailand cannot be seen as an unique phenomenon for Thailand's case. Overseas experience also suggests that even in the country with highly reliance on the use of electronic payment such as in Finland, the share of cash payments in the total number of payments seems to be considerable, although the share of cash in value term tends to be much lower as the average cash payment is relatively small. According to the Bank of Finland's 1992 survey of households' use of different payment methods, the share of cash payments in the total value of households' payments was 40%, whereas the ratio was 80% for the number of payments.

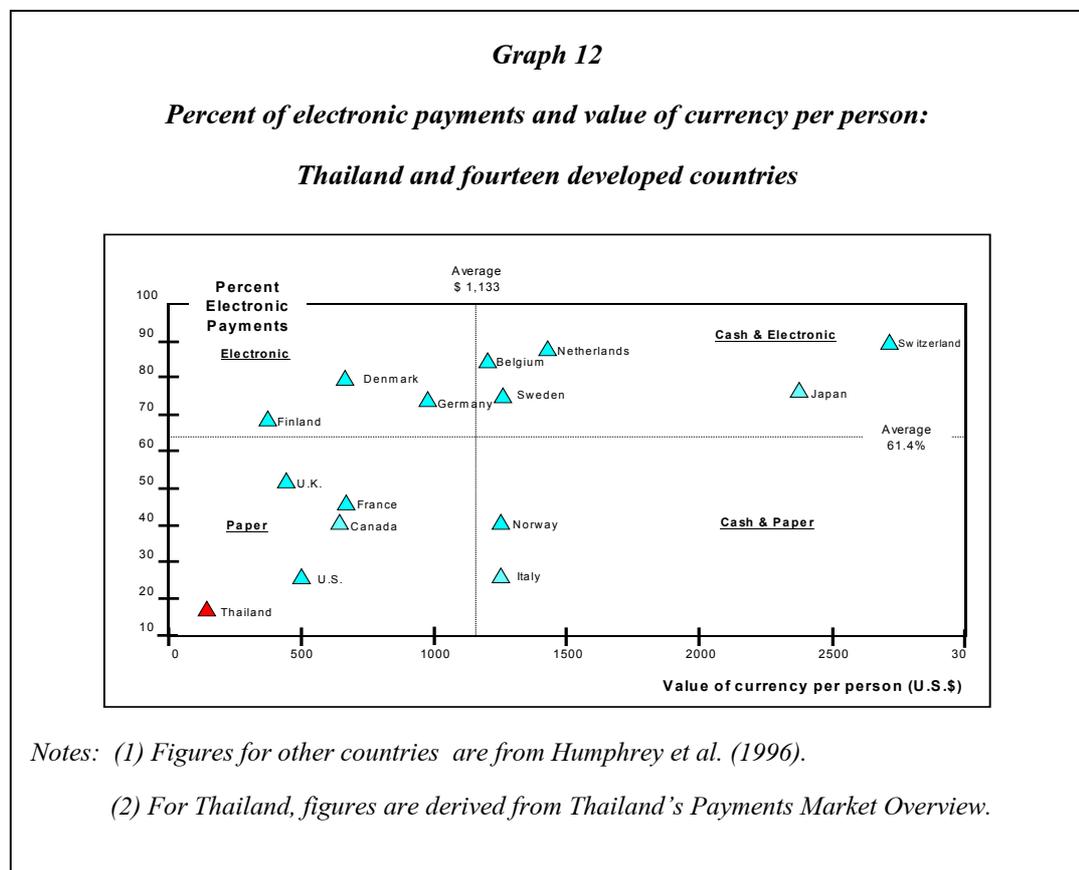
---

<sup>11</sup> Due to its relatively lower value of cash payment, the user costs of this sort of payment, as is commonly accepted, tend to be relatively high compared with alternative instruments for low-value payments such as cheques and payment cards (Humphrey *et al.* 2001).

<sup>12</sup> The choice of which payment instrument to use for a particular type of transaction, as has been often argued, is governed by the average value of the transaction to be made, the user costs, as well as institutional differences among countries. Cash, credit card, debit card, and (sometimes) check instruments have relatively low average values (for example, \$50) due to their intensive use at the point of sale while those check and giro payments used for bill payments and disbursements have higher average value (for example, over \$1,000). Finally, depending on the country large-value financial payments (for example, over \$1 million) are made using highly secure wire transfers or giro payments, but few checks.

### 3.3 Slow shift towards the use of electronic non-cash payment instruments

As mentioned earlier, the use of electronic means of payments in Thailand has progressed at a relatively slow pace when compared with many countries (Graph 12). Card payments in the form of debit cards, e.g. VISA Electron, have not yet received considerable attention from the end-users, although this may be not the case for credit cards that have gained continual popularity as one of the major used forms of electronic payments for retail transactions. Similar to the case of debit cards, credit (funds) transfer in the form of the so-called “Off Line Retail Fund Transfers” (ORFT) has not yet become the payment instrument of choice for consumers, despite the constant encouragement on the part of the Thai authorities to promote the increased use of this sort of payment instrument for fund transfer among different types of bank’ clients. As one can see from Table 29 in Thailand’s Payments Market Overview (2003), the value of this sort of electronic fund transfer accounted for the mere amount of 2.5, 15.4 and 38.1 billions baht for the respective years of 2000, 2001 and 2002, while the amount of fund transfer per transaction for the years 2000-2002 was in the range of 4,740-6,360 baht.



The slow speed in the use of electronic means of payments in retail transactions in Thailand tends to remain so in the intermediate future, say three to five years, unless a number of barriers to the use of electronic means of payment have been resolved or overcome to a significant degree. Possible barriers to the slow shift towards the use of electronic non-cash payment instruments can be linked to a number of “demand-related” and “supply-related” factors.

➤ First, it has been claimed that for users to make optimal decisions concerning payment instruments, cost differences must be reflected in the prices they pay, and they must be able to realize the savings from the choices they make. As pointed in Humphrey *et al.* (2000), although the costs of electronic payments have been found to be relatively lower than those for paper-based payment instruments such as cheques as portrayed in Table 3, experience in many countries indicate that payers have little incentive to choose a lower-cost method. However, as it can be argued, this may be not particular the case unless strong price incentives has been consistently implemented as is the case in Norway, Australia, and Finland. As will be discussed in more details in Section 4, the use of price incentive has been found to help increase the share of electronic payments in Norway from 10% in 1987 to 60% in 1996.

In the case of Thailand, the slow process in the shift to electronics, as it has been often argued, may be responding in part to the relatively lower fees for writing cheque. As there is a tendency that financial institutions may seek to recover the relatively high costs of providing this kind of payment service at some point in the future, it still remain to be seen whether the proposed scheme on the increased fees for writing cheque would help speed up the shift to the use of electronics as a major mean of retail payment services for end-users in Thailand.

In the Thai context, fees charged for certain types of electronic payment instruments have been seen as not much difference from those of paper-based instruments. Such a relatively narrow level of cost differences, as it has been argued, provided little incentives for the end-users to shift from the use of paper-based payment instruments to the use of more cost-effective instruments such as electronic payment instruments. This, in turn, led to the minimal migration

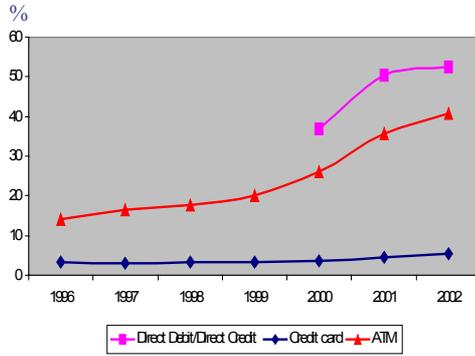
from electronic payment instruments to cash and cheque. At the first glance from Table 1, it seems likely that the share of electronic based payments for retail transactions tended to have increased slightly from around 6% in 2000 to around 13% in 2002.

A closer look to the figure, however, indicates that such an increase in the share of electronic based payments has been largely associated with the sharp increase in the share of ATM usage from around 5% to 10% over the same period. By contrast, there seems to be little change with respect to the growth of the use of other types of electronic payments instruments, in particular credit card and pre-authorized under the SMART system (credit transfer). As one can see from Graph 13, the rate of growth of credit card in relation to GDP appeared to maintain at 4-5% over the years 1996-2002, compared with 12-32% for the use of cash. In addition, as argued earlier, the ATM withdrawals have been seen as a rough proxy for cash transactions. They have been used in retail payment transactions as being often the case in most industrialized countries. Under such circumstances, it may be inappropriate to treat the value of ATM withdrawals as part of the total value of electronic payments in the context of countries like Thailand.

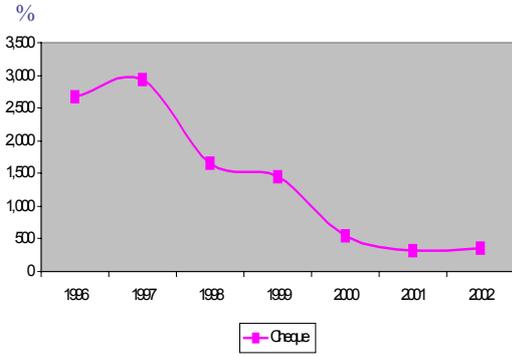
**Graph 13**

**Growth of non-cash payments instruments and ATM in Thailand**

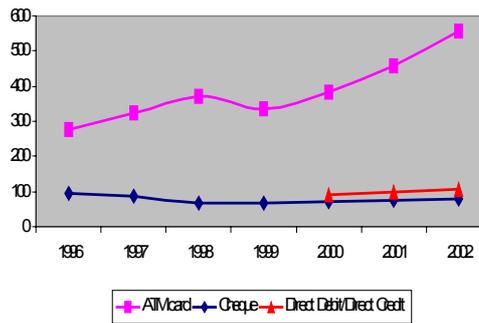
a) The use of ATM, Direct Debit /Direct Credit, and credit card (value / GDP ratio)



b) The use of Cheque (value / GDP ratio)



c) Use of non-cash payment instruments (in mln of transactions)



**Note: Based on data from Thailand's Payments Market Overview(2003)**

➤ Second, it seems likely that some of the electronic payments mechanisms, including debit cards, SMART, EFT-POS, ITMX (Inter-bank Transaction Management and Exchange), and “C2B” payments mechanisms, may find it increasingly difficult to gain ground for use in retail transactions in Thailand unless there are increased cooperation among market regulator, the BOT, and major market players like TPA. Experience in overseas countries suggests that the production of certain types of electronic payments services contains the substantially high fixed costs and/or development costs. This implies that “scale economies” and “network externalities” are of particularly important, as the potential existence of such network externalities nature would enable commercial banks to have lesser costs in developing and applying new technology for the establishment of some certain types of newer payment services. A closer cooperation among service providers, as will be discussed in more details in Section 4, is therefore needed to help minimize the substantial level of fixed cost. Without such an attempt, it appears to be difficult to encourage the growth of certain types of electronic payments services, e.g. EFT-POS, from infancy to greater maturity, as characterized in Graph 10.

➤ Third, the convenience and breath of electronic payment instruments tend to be significantly lower than paper-based instruments, especially those of cheque and cash, although production costs for most electronic payment instruments seem to be relatively lower. This seems to be particularly so in the case of Thailand where the bank branch network has been relatively extensive. With the substantial size of the branch networks being put in place, commercial banks in Thailand tend to have less incentive to provide new methods of payment in the form of electronic-based payment instruments and to encourage their customers to use these sorts of new payment services, despite the notion that new types of electronic modes of payment seem to be cheaper to operate than traditional paper-based methods.

In addition, the use of certain types of these sorts of electronic payment instruments may be regarded as not being user-friendly for users in most emerging economies, although it is likely that certain classes of traditional means of electronic payments such as debit cards/credit cards have been relatively more cost-effective. This may be particularly the case in some countries like Thailand where the level of education of the end-users tends to be not that high when compared

with those in industrialized countries. Apart from this, there tends to be limited use of computer throughout the society, compared with those in industrialized countries. As shown in Table 5, the degree of computer usage and the internet banking in most emerging economies appears to be much lower when compared with those in developed countries. In view of this, the shift to the use of new types of electronic payment instruments, especially those related to internet banking facilities, may be inconvenient from the point of views of end-users in emerging economies.<sup>13</sup> This may be part of the reasons why cheques (and cash) still have been widely used as major modes of retail payment in emerging economies like Thailand, despite the likely that these two kinds of traditional modes of retail payments have been claimed to be not cost-effective from the social costs' point of view.<sup>14</sup>

---

<sup>13</sup> However, this seems to be in sharp contrast with many industrialized countries. As one can see in the case of Finland, almost all of transactions in retail payments have been executed with the use of automatic devices, including the widespread use of electronic billing and payments. Such the heavy reliance on the use of electronic-based payments instruments has been viewed as being efficient, as it has resulted in the cost-effectiveness. There are a number of salient factors contributing to the high degree of cost-effectiveness, including in particular (i) the small number of commercial banks of around 3-4 banks, (ii) the widespread usage of internet banking, and (iii) rapid innovation in information technology. See, for example, Leinonen (2003) for further details on this issue.

<sup>14</sup> According to the U.S. government projection, it costs about 43 cents for every paper cheque distributed by the government, while it costs only 2 cent for an electronic payment. (Manning, Margie, 1996)

Table 5

## E - finance: selected indicators (1999)

	Real GNP per capita (US = 100)	Internet users as % of inhabitants	Mobile phones per 100 inhabitants	Bank customers using online banking (%)	Electronic brokerage transaction: % of total
Australia	75	32	34	4	22
Finland	71	41	65		
Germany	74	18	29	12	32
Japan	79	21	45		32
Sweden	69	41	58	31	55
United Kingdom	70	21	46	6	26
United States	100	27	31	6	56
Hong Kong	71	36	64	2	1
Korea	49	23	50		65
Singapore	70	24	42	5	10
Argentina	37	2	12		
Brazil	21	2	9	4	6
China	11	1	3		3
Czech Republic	40	7	19	3	
India	7	0	0		2
Malaysia	24	7	14	<1	
Mexico	25	2	8	4	41
Nigeria	2	0	0		
Poland	26	5	10	<1	
South Africa	27	4	12		
Thailand	19	1	4		

Source: BIS estimates based on data from the World Bank, central banks and claessens et al. (2000,2001)

Fourth, uncertainty about the adequate demand for the use of newer types of payment instruments in the form of electronic instruments can be also claimed to be an additional factor inhibiting the developing the supply of new services. Unlike the experience of most of other cheque-based payment countries, there tend to be little evidence indicating the significant shift from the use of cheque toward the use of electronic-based payment instruments for Thailand's case. Major barriers to the use of electronic payment instruments in Thailand, as it has been argued, tend to be associated with the *demand-side factors*, in particular the convenience and breath of electronic payment instruments, rather than the *cost-side factors*, especially the relatively lower cost of providing the electronic payment instruments.

As claimed elsewhere, the mere existence of supply and the relative lower costs, does not necessarily guarantee a swift adoption of new methods (electronic means of payments). If the demand for new services fails to materialize, the result would be that the new innovations will not achieve the critical mass of consumers needed for a breakthrough in useage. The relatively limited success of e-money in the case of Finland provides a good example of an innovation the use of which has so far failed to fully fulfill prior expectations. Apart from the supply of new payment methods, demand factors should be taken into consideration when forecasting future changes in retail payment landscape. The problem is that demand is inherently hard to forecast (Bank of Finland 2000).

Fifth, on the positive aspect, however, it is likely that the increased reliance on the use of some forms of electronic payment instrument, especially credit card, may have become more pronounced in the near future, following the recent development in the use of credit cards as one of the major modes of payments in the area of e-commerce business transactions in Thailand, as well as the use of internet banking facilities for payments in business transactions. As one can see from Table 6, the value of payments through the use of internet banking facilities for Thailand's case has increased remarkably from the mere value of 0.3 billion baht in 2000 to 8.6 billion baht in 2001 and 730.5 billion baht in 2002.

<b>Table 6</b>			
<b>The use of internet banking in Thailand</b>			
	2000	2001	2002
Number of agreements	21,102	97,101	254,989
Volume of transactions	3,300,000	6,243,407	9,990,969
Value of transactions (billion baht)	0.3	8.6	730.5

Source: Thailand's Payments Market Overview (2003)

Apart from these, the BOT and a number of commercial banks is currently in the process to set up a company to run an ITMX system, which will provide a core inter-bank infrastructure to support a payment system and e-commerce. The primary objectives of the introduction of the ITMX are to provide an infrastructure for e-commerce transactions, to reduce duplicate investment, and to offer an efficient service for payments between banks and their customers.

### *3.4 Implications on efficiency of retail payment system*

#### *3.4.1 The use of cheques and implications on efficiency in the retail payment system*

The fact that cheque has been a predominant type of payment, while electronic modes of payments have relatively little role to play in retail transaction, in Thailand has raised a number of public interest issues regarding to competition and efficiency in Thailand. Evidence of this kind coupled with the recent improvement to the cheque clearing system has raised a number of public interest issues regarding to competition and efficiency in Thailand.

For one thing, it may reflect that the pricing by banks tends not to reflect the relatively high costs of processing for this sort of payment instrument. It has been claimed the divergent trends toward the use of cheque payment instrument seems to be in part linked to the structure of fees charged by financial institutions (BOT, 2000). As argued in the mentioned paper, there tend to be under pricing of the cheque usage, as the pricing for electronic instruments tends to be relatively expensive than the paper-based instrument such as cheque.

For another, electronic payment instruments may be viewed not as close substitutes for cheque. Evidence in many countries suggest that the use of cheque tends to have provided additional benefits for the users in terms of a relatively higher degree of control on the part of the users compared with those of electronic payments. As such, one needs to be cautious about the issue of degree of substitution among various types of retail payment instruments.

Although paper-based payment instruments such as cheque are reported to be more expensive than electronic instruments, one needs to be cautious with the notion that the relatively heavy reliance on the use of cheque in the retail payment system would lead to a sub-optimal efficiency of the retail payment system of a country. As mentioned above, the cost of producing payment services is considered to be one dimension of efficiency. There are at least two other important dimensions of efficiency for the case of cheque usage.

The first is performance. Minimizing production costs, as it can be argued, does not necessarily lead to maximize efficiency if it is at the expense of performance. Although the heavy reliance on the use of some form of paper-based payment instruments such as cheque may incur a relatively higher cost, its use has generated a number of positive aspects for users, including in particular (1) more convenience, (2) improved reliability and control, (3) increased accessibility, (4) faster processing of transactions. Such the afore-mentioned aspects, as has been widely accepted, can be regarded as important elements of a payment system that can increase efficiency, even at a higher cost. The second dimension is related to pricing. As commonly agreed, a payment system will not be efficient unless the relative costs of payment instruments are reflected in their relative prices, so that consumers have appropriate signals on which to base their decisions (Reserve Bank of Australia, 1999).

### 3.4.2 *The use of cash and implications on efficiency in the retail payment system*

As alluded to above, the continuous reliance on the use of cash as a major mode in retail transaction in Thailand has been claimed to be associated in part with the relatively low level of the users cost and in part with the relatively high degree of convenience. However, such the huge reliance on the cash usage may be a cause for concern for policy makers and many economists. As pointed out in the previous sections, there tend to be a slow shift toward the use of cash substitution products, as reflected by the continuous decline in the ratio of credit card usage to cash usage in the years 1996-2002, dropping remarkably from around 24% in 1996 to around 14% in 2002. Given such a trend along with the overall trend in the use of cash for retail transactions discussed earlier, it is likely that the social cost of cash under the present circumstances tends to be of particularly substantial.

To gain a better understanding of the magnitude of the social cost of cash and its effects on efficiency of the retail payment system, it is perhaps particularly useful to look at the estimated figures of the social cost of cash in overseas countries. In the UK case, as portrayed in Table 7, the social cost of cash in 1993 was estimated to be at UKP 4.5 billion on an annual basis that is equivalent to 0.75% of GDP. Of this, UKP 1.5 billion tended to be related to *opportunity costs* (interest rate foregone) and UKP 3 billion to *handling costs*. For the case of Belgium, the social cost of cash, excluding opportunity costs, was estimated to be in the range of 25 to 40 billion BEF in 1995 (0.35%-0.65% of GDP). Given this, many economists appear to agree that considerable social costs could be reaped by encouraging the use of more efficient electronic payment systems and by discouraging the use of cash.<sup>15</sup>

---

<sup>15</sup> Although it seems to be not a simple task at this stage to acquire reliable data on the social cost of cash for Thailand, it may be of some particularly useful to shed some light on the extent to which the process savings (and efficiency improvements) can be gained if one can move certain portion of cash handling costs out of the system, enabling a society' labor and capital to be focused on more productive activities. Based on the empirical evidences mentioned earlier, the social cost of cash, excluding opportunity costs, for Thailand appears to be in an approximate value of 0.35% of GDP.

**Table 7****ESTIMATED SOCIAL COSTS OF CASH AND IMPLICATIONS ON EFFICIENCY** **The case of U.K.**

- UKP 4.5 billion (about 0.75% of GDP) ~ total social costs
- UKP 1.5 billion (about 0.25% of GDP) ~ opportunity costs
- UKP 3.0 billion (about 0.50% of GDP) ~ handling costs

 **The case of Belgium**

- BEF 25-40 billion (about 0.35% - 0.65% of GDP) excluding opportunity costs

*Source: Van Hove (2001)*

#### **4. The role of the BOT in the retail payments and challenges for efficiency enhancement**

Similar to the experience of central banks in many countries, the BOT has played an active role in the retail payments business, largely in the form of (1) interbank collection of cheques, (2) distribution of currency throughout the banking system, and (3) processing of Electronic Cheque Clearing System (ECS) through the Electronic Clearing House (ECH). An increasing use of new modes of electronic payment instruments, as it can be argued, could result in the reduction of the BOT's cheque collection and currency distribution businesses. However, as will be discussed in more detail later, more efficiency in retail payment system does not necessarily imply the heavy reliance on electronic means of payments. In the view point of BOT, like central banks in many industrialized countries, businesses, and consumers are encouraged to ensure that the setting-up of payment system is *as efficient as possible*.

Against the background discussed in the previous sections, it has become apparent that cheque, cash, and credit cards, the established retail payment tools, will all have a place to play, though at a relatively different degree in the period ahead. In addition, the available evidence tends to suggest that there seems to be a moderate degree in the shift toward the use of electronic payment instruments in the case of Thailand. It also seems likely that there tends to have a gradual changes in market arrangements for retail payment instruments and services, especially with respect to service providers and pricing. In view of this, it is important in this section to shed some on the issue of *how to encourage the medium-term and long-term efficiency of the retail payment systems in Thailand*. This can be carried out in part by way of looking at a number of initiatives undertaking by the BOT to help bring automation to the cheque clearing process, as well as a set of potential efforts aimed to help enhance a more efficient retail payment system.

*Views on efficiency in retail payments.* Before delving into details, it is perhaps useful to start first with the discussion of some views about efficiency in retail payments as well as general criteria for assessing the levels of efficiency in retail payments. As commonly agreed, efficiency in payment systems has long been regarded as one of the major aspects of the central banks' core

purposes in most countries.<sup>16</sup> The view of the kind is based on the premise that payment systems impose *resource costs* on society.<sup>17</sup> So, it is important that the provision of payment service satisfies some basic principles of efficiency.

However, as has been widely agreed, efficiency in payment systems is not easy to define, since it involves many different aspects. In particular, none of which have been the subject of much research. As one can see, not only price, social and private costs of making payments are claimed to be important, but also such aspects as convenience, speed, trust and reliability are contributing factors to the efficiency of payment systems. The later group of factors is normally referred to as “non-price” factors. Generally speaking, a payment system is said to be efficient if the net benefits it provides to society are being maximized. In economic theory, three dimensions of efficiency are often identified:<sup>18</sup>

➤ *allocative efficiency*: the extent to which *total welfare* of consumers and suppliers is being *maximized*;

➤ *productive efficiency*: the extent to which *costs of production* are being *minimized* given the current level of technology;

➤ *dynamic efficiency*: the extent to which suppliers are able to meet the changing needs and preferences of consumers over time (product innovation) in the most efficient way (process innovation).

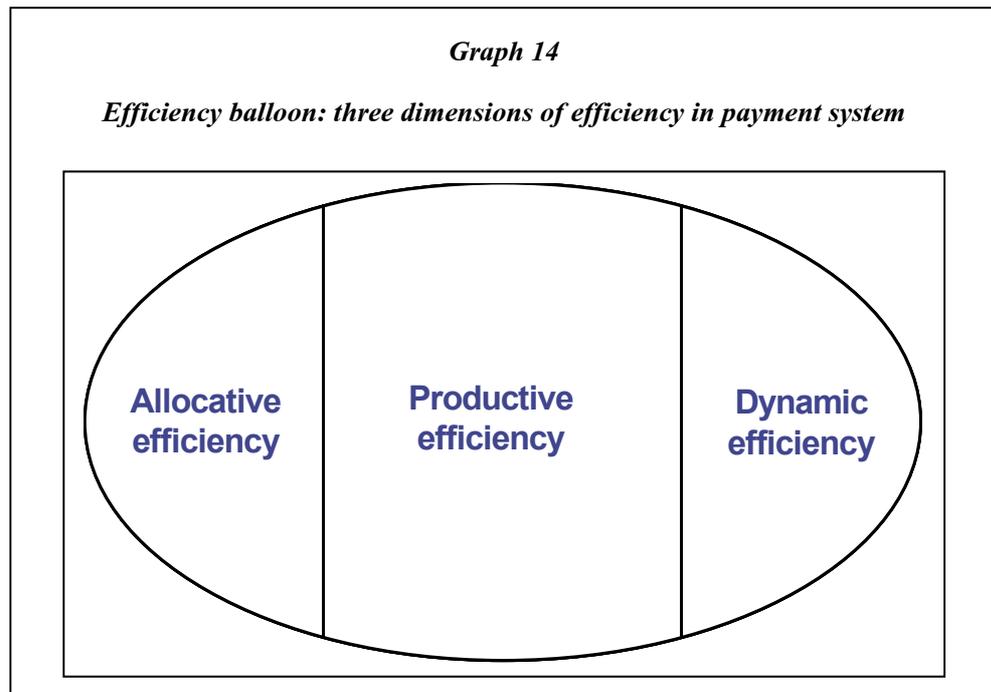
---

<sup>16</sup> For more details, see Annual Report on Payment System of Australia, Norway, to name but a few.

<sup>17</sup> According to Humphrey *et.al.* (1990), the real resource costs or the total social costs of each type of payment instrument is considered to be the summation of the costs associated with *production* (costs to manufacture payment instruments), *use* (costs to originate and receive payments), and *processing* (costs to clear and settle the payments, incurred by banks and other financial institutions).

<sup>18</sup> In practice, a trade-off typically exists between minimizing resource costs and achieving other objectives, e.g. safety. Designers of payment systems should economise on resource costs by being practical in the specific circumstances of the system and by taking into account of its effects on the economy as a whole.

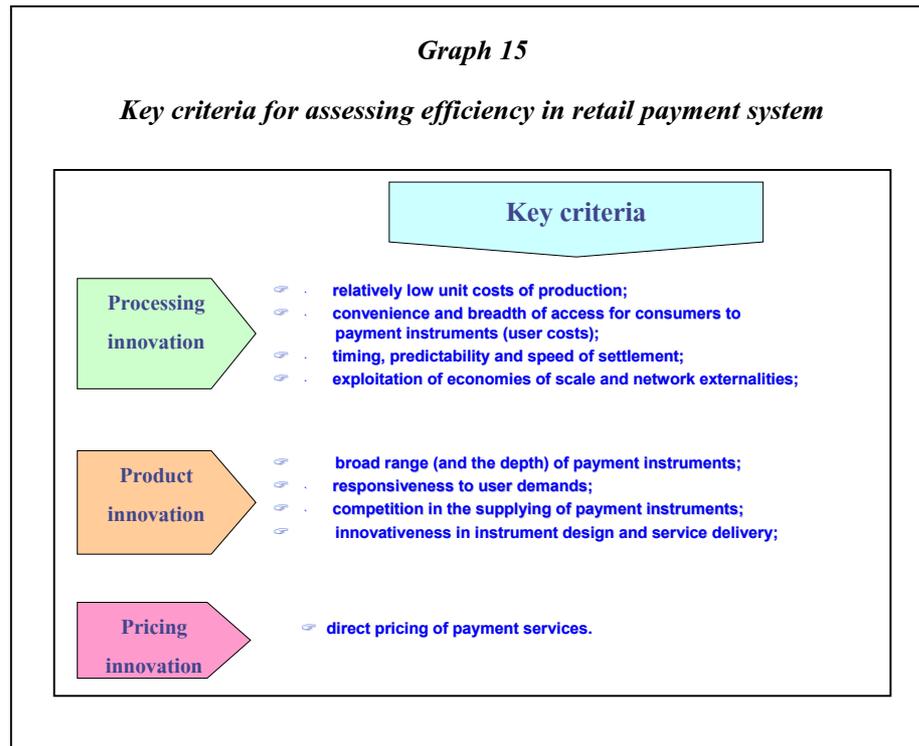
As implied from Graph 14, in practice, the process of improving efficiency level is not viewed as being “static”. Indeed, it is tackled “dynamic” as a process to be pursued over the medium and long term.



As has been widely cited in the literature, the *efficiency goals* most frequently cited in the discussion of retail payments are claimed to be associated with a number of *characteristics* of retail payment systems. Chief among these include:

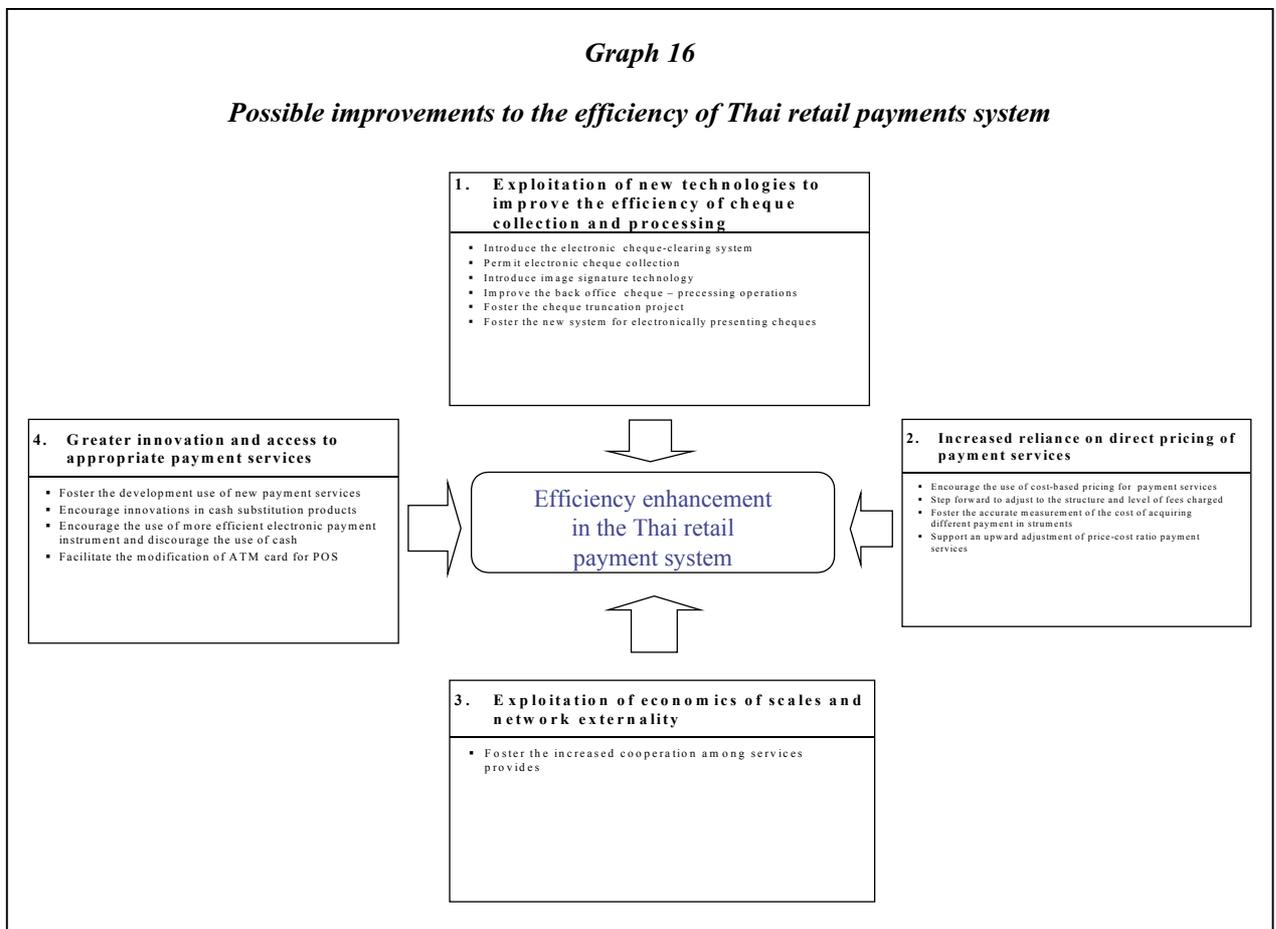
- relatively low unit costs of production;
- convenience and breadth of access for consumers to payment instruments (user costs);
- timing, predictability and speed of settlement;
- exploitation of economies of scale and network externalities;
- broad range (and the depth) of payment instruments;
- responsiveness to user demands;
- competition in the supplying of payment instruments;
- innovativeness in instrument design and service delivery;
- direct pricing of payment services.

With the risk of oversimplification, the afore-mentioned characteristics could be broadly grouped into the following 3 headings: (1) process innovation, (2) product innovation, and (3) pricing innovation. Graph 15 provides illustrative examples of key criteria for assessing efficiency in retail payment system.



*Role of the central bank in the payment system.* Based on the evidence gained from analysis in the previous sections, along with experiences in overseas countries, the BOT has window of opportunity to undertake a number of important initiatives to gain more efficiency in the Thai retail payments system. As commonly known, central banks have many roles to play in the retail payment system: *Operational role*, *Oversight or Regulator role*, and *Catalyst or Facilitator role*. In this regard, as portrayed in more detail in Graph 16, there are four/five key areas of *opportunities/challenges* for the improvements of efficiency in the retail payment system from these perspectives:

- encouraging the exploitation of new technologies to improve the efficiency of cheque collection and processing;
- fostering wider implementations of cost-based pricing for payment services;
- encouraging the exploitation of economies of scale and network externalities;
- encouraging greater use of electronic payments;
- fostering greater innovation in payments instruments/services, especially those related to cash substitution instruments.



#### *4.1 Fostering the development and implementation of electronic cheque collection and cheque truncation project*

Although there is a tendency that other forms of retail payment instruments, such as electronic payments, which are relatively more cost-effective products, may have become more increasingly used in the near future in many countries, empirical evidence shown in the previous sections suggests that cheque payments continue to constitute to a major portion of retail payments in Thailand, accounting for more than 85% of the total non-cash payments. Looking ahead, the BOT recognizes that whatever innovations develop, the use of cheque in retail payments will likely be with us for many years. As mentioned earlier, Thais still write about 74-78 millions cheques a year, and the numbers are expected to grow further. In value terms, cheque usage accounted for more than 85% of the total non-cash payments.<sup>19</sup>

Given that there tend to be little changes with respect to the pattern of cheque usage, the BOT, in its role as a service provider, is seen as in a good position to provide incentives to introduce new products or services that might help move the payment system away from paper and toward more efficient electronics. The introduction of cheque truncation project in the recent period and the potential adoption of cheque-imaging technology, apart from the implementation of the ECS system in 1996, have been seen as attempts on the part of the Thai authorities to initiate a number of measures to modernize the country's cheque-processing systems. The launching of a number of such initiatives, as shown in Table 8, is primarily aimed to achieve the *lowest unit cost* in the system for retail payments, especially those related to the cheque usage.

---

<sup>19</sup> The figures mentioned in the text refer only to interbank cheques. The mentioned figures thus tend to underestimate the actual usage of cheques in Thailand, as they exclude the number of cheque usage operating under the so-called B/C -3 Day project.

**Table 8**  
**Measures and/or Initiatives to enhance the medium-term and  
longterm efficiency of cheque**

➤ *The adoption of the electronic cheque-clearing system.* The first move is to introduce the *electronic cheque-clearing system (ECS)* by the BOT in July 1996. The introduction of this system has also been seen an important step toward the use of electronic cheque collection and presentment, and thus leading to a more efficient and cost effective. As one can see, ECS has retained the lion share over the past many years, accounting for about 73.5 percent in value term in 2002.

➤ *Improvement of provincial Bill for Collection (B/C).* Another development in this direction is to introduce *image signature technology* in February 2003 that will reduce time of clearing cycle of B/C from 6 to 3 business days. The new arrangements are seen to be more efficient than the previous ones, as they could help reduce the time of clearing cycle of B/C to a three-day cycle. More specifically, the *processing cost* under the new arrangements tends to be lower than the pervious ones. Such a lowering of cheque-clearing times associated with the introduction of the B/C 3 day project tends to have lowered the cost of processing to some certain degree, and thus contributing to a lowering of real resource costs for the use of cheque.

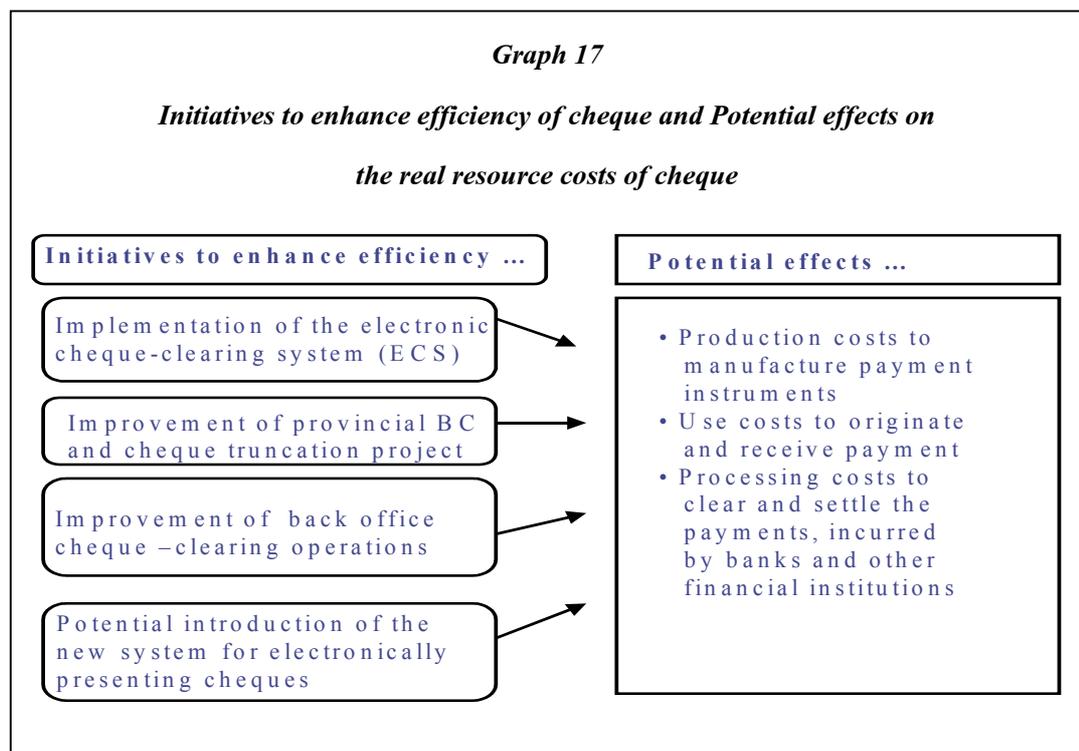
➤ *Improvement of operational risk.* Reflecting the commitment of the BOT to maintain its highly quality in providing payment services, especially in the area of cheque service, the BOT has initiated a scheme to help reduce risks in its back office cheque-processing operations. This scheme, covering the period from March 1, 2002 to February 28, 2003, is intended to improve operating efficiency while maintaining high-quality cheque services to depository institutions nationwide. As documented elsewhere, the Bank has been now able to identify various types of risks associated with its cheque service operation, including in particular Even Risk, Operational Risk, Technology Risk. Risk reduction involved in the Bank's cheque service operation can partly be minimized through a combination of streamlining their cheque management structure.

➤ *Potential introduction of the new system for electronically presenting cheques.* To gain further enhancement of the efficiency of the cheque-processing system, the Bank is in the process of studying the possibility in the *introduction of the new system for electronically presenting cheques*. The main essence of the new system includes capturing and storing the image of cheque and enabling institutions to make payment decisions in real time by accessing these images through the Internet. In short, a project is in hand to replace the paper presentment of cheque with electronic presentment.

Source: Payment Systems Group, Bank of Thailand

It can be argued that the initiatives mentioned above along with the potential adoption of cheque-imaging technology as well as a set of potentially introduced measures could be of some help in improving the level of efficiency of the cheque system of Thailand in a number of aspects.

➤ First, as summarized in Graph 17, it is likely that such initiatives would lead to the reduction in the transportation costs and lesser costs for cheque collection system, although definitive evidence is not yet available. As one can see, the introduction of ECS system and the cheque truncation project has enabled cheques to become more attractive in relation to other forms of competitive payment instruments, especially credit cards and ORFT. The rationale for this lies in that the implementation of ECS system and the cheque truncation project have helped increase the level of convenience and the breadth of access for businesses (and consumers) to this sort of payment instruments, and thus contributing to the reduction of the *real resource costs* from using cheques in (retail) transactions. The cost savings from using cheque as a mode of payment has been seen as a positive outcome from the efficiency's point of view, as its use tends to contribute to a reduction of user costs as well as processing costs for some certain degree.



➤ Second, as it has been claimed, the technologies used in electronic processing and presentment have been claimed to be undergoing rapid evolution, in contrast to the mature technologies used in paper cheque presentment. Thus, any resource cost savings associated with electronic cheque presentment could be expected to grow overtime. However, as has been widely accepted, the cost savings of the kind tend to be offset to some degree by new costs associated with the creation, transmittal and processing of electronic files by collecting banks and cheque collection intermediaries, and the costs associated with the receipt and processing of these files by paying banks. It can be inferred from the above discussion that the processing savings and efficiency improvements move cheque-handling costs out of the system, leaving a society's labor and capital to be focused on more productive activities.

Attempts to enhance efficiency in the use of cheque as a mode of payment can also be seen if one looks at experiences of central banks in many countries in moving towards the implementation of a scheme to help reduce risks in its back office cheque-processing operations. As one can see, in the cheque-based payment countries like those in the U.S., the Federal Reserve Banks have over the past many years initiated a number of important changes to their (back-office) cheque-processing operations intended to improve operating efficiency while maintaining high-quality cheque services to participants in the cheque market. Although recent studies have suggested the sharp decline in the share of cheque in the total non-cash retail payments from about 85% in 1979 to only 60% in 2002, the Federal Reserve Banks are still committed to remaining a leader in providing payment services, including cheque processing, despite such changing market environment. The study also indicated that roughly 40 billion cheque were written in the United States in 2002, down from about 50 billion in 1995. Of these cheques, the Reserve Banks handle about 17 billion annually, and this volume is expected to decline as well.<sup>20</sup>

---

<sup>20</sup> For more details, see Federal Reserve Bank of Boston Press Release on February 6, 2003. The Release is entitled Federal Reserve Banks Announce Changes to Increase Efficiency in Check Service (<http://www.bos.frb.org/news/pdf/fspc02603.pdf>-02-06-03).

#### 4.2 *Fostering a wider adoption of cost-based pricing for payment services*

Additional attempts to improve efficiency in the retail payments, as portrayed in Graph 16, can be seen from the BOT's efforts to foster the use of cost-based pricing for payment services. Efforts along this line appear to be in part encouraged by the findings in overseas countries that direct pricing of payment service is an effective way to influence the shift from paper to electronic payments. As pointed in the study by Humphrey *et al.*, (1998), electronic payments have been priced lower fee due to their lower cost.<sup>21</sup> The use of price incentive of the kind has been found to help raise the share of electronic payments in Norway from 10% in 1987 to 60% in 1996. The use of this sort of pricing incentive, as has been claimed, has the potential to lower the costs for bank and end-users. Lowering the provider and user costs is seen as one of the major characteristics contributing to a more efficient retail payment system.<sup>22</sup>

Apart from the Norway's experience, evidence obtained from the case of Australia also indicated that the use of pricing policies led to a substantial reduction of the number of in-branch transactions. That is: the ratio of electronic to in-branch transactions has been found to move up apparently to around 70:30 following the introduction of pricing policies that encourage retail clients to utilize electronic channel.

---

<sup>21</sup> As shown in Table 3, the total cost of paper-based payment in the case of the United States is estimated to be around \$2.93, compared with \$1.31 in the case of electronic payment. This suggest that the overall costs (payor, payee, and bank) for electronic payments are estimated to be around 40 to 55% less than a comparable cheque payment.

<sup>22</sup> It has been claimed that payment services are often treated as loss leaders as par of the whole banking service package. This can be clearly seen in the pricing of payment services where indirect pricing through cross-subsidization is common. Payment services are offered free or underpriced but, at the same time, they are implicitly charged through low interest rate on transaction account balances. This is a very important issue because direct pricing of payment services can be used to influence consumers' choice of payment instruments. In fact, direct pricing of payment services has been gained popularity in recent years. The proponents of this direct pricing approach have welcome this development and have stated that this has increased the efficiency of payments by guiding the customers to use a more efficient payment instrument.

The move toward the adoption of cost-based pricing for payment services seems to be in part related to the notion that there tends to be a slow shift towards the use of electronic payments instruments in Thailand, as reflected by the slow growth in the use of credit cards that have been regarded as close substitution products for electronic payments instruments for Thailand's case. As one can see from Graph 13, the growth of credit card in relation to GDP have maintained at a relatively stable level of 4-5% over the years 1996-2002. In addition, as has been discussed in the previous section, it seems likely that indirect pricing through cross-subsidization tend to be widely practiced in the Thai market. As has been claimed elsewhere, certain payment services in the Thai market have been offered free or underpriced but, at the same time, they are implicitly charged through low interest rate on transaction account balances.

The trend in the use of electronic payments instruments of this kind along with the findings in overseas countries that direct pricing of payment services can be used to influence consumers' choice of payment instruments have lent support to the use of direct pricing by central banks in many countries including Thailand. In view of this, an increased use of direct pricing approach for all payment services has been seen as an additional factor contributing to more efficiency in the retail payments system, as it can be used to influence consumers' choice of payment instruments by guiding the customers to use a more efficient payment instrument.

A look at experience of some countries that rely heavily on the use of direct pricing strategy to encourage the shift toward a more cost-effective instrument has provided a number of important lessons for Thailand.

➤ *The first concerns the accurate measurement of the cost of acquiring different type of retail payment instruments and servicing end-users.* Without reliable data on the costs of producing payment services, it is not a simple task to make an accurate appraisal of efficiency in retail payment. This seems to be of particularly so in the case of Thailand where data are not available in Thailand.

However, it is important to note that even in the countries that have reliable data the costs of producing payment services, the pricing and fee charged by service providers may be not always linked to the costs of providing different types of retail payment services. As pointed out in the Reserve Bank of Australia's annual report (2000), there seems to be unclear pattern with respect to the costs of providing payment services and the fees charged by commercial banks in Australia. In principle, the orderings of costs from high to low for the following set of retail payment services are in the order of cheque, direct credit, and direct debit; while the orderings of the fees charged classified from high to low such the retail payment services are in the order of over the counter transactions, cheque transactions, electronic transactions (EFTPOS). However, as shown in Table 9, some banks tended to charge the same prices an/or fees for cheque and EFTPOS. This is particularly so in the case of ST.George and Westpac banks.

**TABLE 9**  
**Transaction fees for retail payments instruments: the case of Australia**

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

1 Maximum of 2 over-the-counter

2 Maximum of 4 over-the-counter and cheque

n.a. not applicable

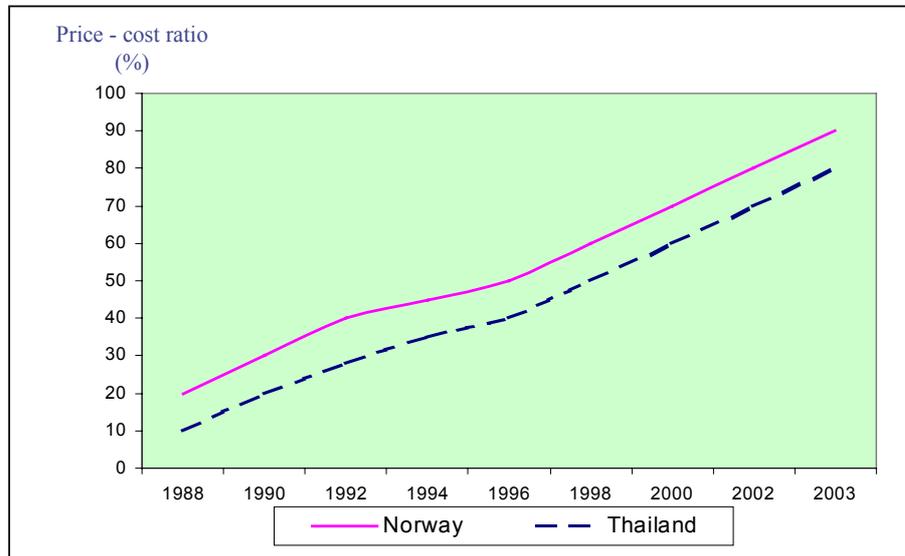
Source: Annual Report on Payment System, Reserve Bank of Australia.

➤ *The second issue concerns the possibility that the end-user of different types of retail payment instruments does not necessarily face the full cost of his/her decision to use different set of payment instruments. As such, in some certain cases, it is effectively “overused” relatively to a situation where the full cost is assessed to the end-users. Experience in oversea countries, as portrayed in Table 10, suggests that customer prices tend to be lower than banks’ unit costs, even in the country like Norway where the pricing strategy has been heavily used in setting the fee and charges for each type of financial services.*

	Transaction <sup>1</sup> (million)	Total costs <sup>2</sup> (NOK Million)	Costs <sup>3</sup> (NOK)	Price <sup>4</sup> (NOK)
Mail giro	74	543	7.50	5.14
Giro, account debits	38	564	15.00	18.59
Giro, cash payments	12	161	13.00	27.37
Company terminal giro sent as money order	7	182	24.50	30.14
Phone giro	29	167	6.00	2.45
Internet	66	527	8.00	1.89
Direct debit	33	162	5.00	1.42
Company terminal giro- electronic	144	657	4.50	2.78
Cheques	3	65	22.50	21.06
Payment terminal (EFTPOS)	412	996	2.50	2.24
Own bank’s ATMs	66	562	8.50	2.14
Other bank’s ATMs	39	283	7.50	4.41
Withdrawals/deposits <sup>a</sup>	37	558	15.00	0.00
Transfers <sup>b</sup>	4	116	28.00	0.00
Night safe <sup>c</sup>	6	318	55.50	-
<b>Total</b>	<b>968</b>	<b>5,861</b>		
Average weighted by no. of transactions(except <sup>a,b and c</sup> )			5.30	
Average weighted by no. of transactions (all services except <sup>c</sup> )			5.80	

<sup>1</sup> Transactions taken from Annual Report on Payment Systems  
<sup>2</sup> Transactions multiplied by unit costs  
<sup>3</sup> Unit costs for the seven banks in the survey rounded to the nearest 50 are  
<sup>4</sup> Unit prices for all banks excl. discounts (Source: Annual Report on Payment Systems)  
Source: Norges Bank (2002)

However, in recent years, there has been a substantial improvement in the use of pricing strategy in setting the fee and charges for each type of financial services in Norway. As one can see from Graph 18, the price-cost ratio for retail payment instruments and services tended to have show sign of an upward trend, rising from around 20% in 1988 to 60% in 1998.

**Graph 18****Price-cost ratio of payment instruments: Norway and Thailand**

Notes: Figures for Norway are based on Norge Bank (2002), while those of Thailand are Bank's own estimates.

Additional evidence in this regard lies in that the explicit prices charged to consumers and merchants for using currency, if any, do not cover the full cost. And this makes it very difficult for certain types of competitive products, e.g. electronic purses and other electronic payment systems, to gain ground. In other words, the fact that cash continues to be seen as an efficient and inexpensive alternative is that the public has been spared to the real cost of cash use.

➤ *The third issue concerns the possibility that, in making the choice of different types of payments, pricing factor alone seems to be not strong enough to encourage the shift to electronic payments instruments that have a relatively lower cost for payments in the retail transactions.*<sup>23</sup>

<sup>23</sup> The literature also points to the importance of the quality dimensions of payment services. More specifically, payment instruments differ in quality and other features of the service they provide. Conceptually speaking, such a difference may be characterized into eight dimensions to a payment service: (1) Timeliness, (2) Reliability, (3) Certainty, (4) Convenience, (5) Dispute resolution and guarantee, (6) Security, (7) Documentation, (8) Cash flow flexibility.

Evidence portrayed in Table 11 indicates that even if cheques are more expensive than electronic alternatives, merchants may continue to accept cheques for three reasons. First, the potential cost savings from electronic alternatives might not be large enough to justify the transition costs to make this change and/or risk movement to more expensive payment vehicles. Second, cheaper electronic payment alternatives at the point of sale have only recently flourished. Last, cheques might offer merchants some level of benefits that they are willing to “pay” for.

<b>Table 11</b>						
<b>Merchant costs to accept a payment instrument</b>						
<b>Cost per transaction (dollars)</b>	<b>Cash</b>	<b>Cheques not verified</b>	<b>Cheques verified</b>	<b>Credit</b>	<b>Online debit</b>	<b>Off-line debit</b>
Cost per \$100 sales	0.9	3.0	0.6	1.8	0.8	1.8

Source: Food Marketing Institute, 2000

Cheque and credit cards are examples of payment instruments where customer convenience increased demand, leading to a high growth of volume despite higher costs of processing than alternative instruments. In view of this, the use of direct pricing strategy in the case of Thailand may have to focus on some certain types of electronic payment instrument, in particular credit cards and ATM-debit cards. This is particularly so because some other payment cards (e.g. debit cards) have been not well developed.

Experience in the case of Australia has shown that the use of credit cards have recorded a remarkably higher growth when compared with those of debit cards, although credit is found to be a relatively higher cost. For a credit card transaction of \$100, the card issue has a cost of \$1.93 and the financial institution acting for the merchant has a cost of 43 cents. The cost of a \$100 debit cards transaction is about 26 cents for the issuer and for the merchant’s bank. In an efficient system, as it can be argued, this cost difference would drive consumers to use debit in preference to credit. But, that seems not to be the case for many reasons.

For one thing, banks charge their customers a fee for making debit transactions, while there are no transaction fees for using credit cards. Indeed, consumers are rewarded for using credit through loyalty programs. For another, credit card payment costs are recovered through a system of interchange fee worked out between the financial institutions then passed on to shop keepers in the form of merchant service fees. It seems likely that all consumers would be better off if cross-subsidy were abolished and people were encouraged to use a more cost-effective payment mechanism. As one can see, the only reason the system has persisted so long is that participants in the credit card system have been able to charge high margins (as much as 67%) over the costs.

➤ *The final issue concerns the best pricing method for use in the determination of appropriate prices or fees for various payment services.* “Explicit transaction-based (as opposed to account-based) pricing” that has been widely used in Norway is one solution for this. The pricing strategy of this kind, as it has been claimed, would make visible the real costs of payment services and would motivate consumers to switch to the least expensive payment instruments. As pointed out in Humphrey et al. (1998), there has been a substantial increase in the price-cost ratio during the period under review. That is, transaction prices in 1998 moved up significantly to cover around 60% of banks’ variable costs compared to only 20% in 1988. Another pricing method is the so-called two-part average cost pricing as advocated by Humphrey et al. (1997). According to this view, the price charged is divided into 2 parts: the first price (e.g. a fixed charge per account) would reflect the average fixed cost of providing the payment services, while the second price (a volume-related fee) would reflect the average variable cost.

*Adjustments to the structure and level of fee charged by financial institutions.* In an attempt to help increase the use of electronic instruments as major means of retail payments, there has been a tendency to raise the fees for cheque writing and simultaneously reduce the charge for electronic instruments. However, cautious needs to be extremely carried out in the actual modification of the structure of fees along the line mentioned above. First, one needs to take into account of costs associated with the relatively new type of retail payment instruments. Overseas experience suggests that the fixed investment costs of electronics tended to be reasonably high at the outset and during the transitional period. It may need some time before the use of electronic

instruments can be operated with the economy of scale, or having the so-called externality welfare.

Second, one needs to ensure that the data/information on costs of different types of payment instruments are accurate enough to put in place a strong price incentive in inducing consumer (payers) to demand lower cost electronic payment instrument. In this connection, the BOT is now contemplating to conduct a survey on the cost structure of retail payment instruments. Third, empirical evidences available so far seem to have provided a mix result with respect to factors effecting the use of different payment instruments. According to the empirical results reported in the study of Humphrey *et al.* (1996), difference in the mix of payment instruments in fourteen developed countries tends to be influenced by cultural and institutional factors. In contrast, the own price factors are found to have exerted little influence on the choice or use of payment method. However, different conclusion has been reported in Humphrey (2000).

If the pricing strategy were to be used in actual practice in the future, it is proposed the price for the use of paper-based payment instruments may have to be increased to reflect the costs of transactions. By contrast, the price for the use of electronic-based payment instruments may have to be lowered due to the lower level of unit costs of transaction. In other words, “the price-cost ratio for paper-based payments” needs to move up, while “the price-cost ratio for electronic based payments” needs to move down.

In this connection, it is important for the BOT to produce a periodic review of pricing conventions in the Thai payment system. Current pricing conventions, including the practices of charging households indirectly for payment services through levying merchant discounts on retailers and through the low levels of interest rates on transactions account balances, tend to provide little incentive for use of more efficient payment instruments. It can be argued that pricing conventions that place a greater share of direct charges for providing existing payment services on households might shift usage and provide stronger incentives for innovations. (UK, p. 38).

#### *4.3 Fostering greater innovation and access to appropriate payment services*

Analysis in the previous sections suggests that the retail payment method usage has evolved in a number of aspects during the past decade. However, as pointed out earlier, the retail payments in Thailand have still been dominated by cash and cheque payments, and the role of electronic payments has been found to be relatively small. Credit cards tend to be the most used form of electronic payment instruments in retail transactions in Thailand, while some other types of electronic retail payment instruments, especially e-money and debit cards, have not yet gained ground as major means of payments in retail transactions, although the mentioned two types of payment instruments have been actively used in most European countries.

In search for the more efficiency in the retail payment system, greater emphasis needs to be given to the development of certain types of (product innovation) electronic payment products that are considered to be close substitutes for the cash (and cheque) usage.

➤ First, as a way to speed up the cash substitution process, more effort needs to be done to facilitate the use of debit cards in on-line transactions. For ease in actual application, it is proposed to encourage the use of debit cards in the form of modification of ATM card. The use of such instruments would clearly expand electronic payment capabilities (over the internet) to those with bank accounts who do not hold credit cards.

As discussed, electronic means of retail payments such as debit cards, credit cards, pre-paid cards, have not been widely used in Thailand. The exception in this regard is the bank issue ATM (cash) card. Although ATM cards can be used for withdrawing cash from ATMs, they are not accepted by EFT-POS payment terminal systems in Thailand. This follows that they cannot be used for making payments in shops and/or Department stores. However, ATM cards can now be used for initiating credit transfers. This can be carried out, in the Thai context, through the BOT payment facility of the so-called ORFT.

Overseas experiences suggest that the wide spread use of debit card can lead to the significant reduction in the use of paper-based payment instruments. This tended to happen not only to the use of cash, but also to the use of cheque. As one can see from Table 12, although cash still remains by far the most prominent, both in numbers of transactions and in total value, when compared with other types of payments instruments for use in POS transactions, it has become increasingly apparent that debit card and credit card have gained increased popularity. In value term, debit card accounted for nearly 42% of the total value of POS transaction in the Netherlands in 2003. Interestingly, as pointed out in the recent study by De Nederlandsche Bank (2002), over the past decade, the number of electronic POS payments has boomed from 20 millions in 1991 to 954 millions in 2001, taking market share away from especially cheque payments, where number fell from 290 million to 5 million in the same period. Given the continued advance of the number of electronic payments, the current trend is a progressive substitution of cash by electronic payments.<sup>24</sup>

➤ Second, given that there have been relatively limited use of different types of retail payment instruments in the Thai market, it suggests that there are still plenty room for the central bank and banking industry to initiate new types of payment instruments to gain more dynamic efficiency of the overall payment system. As has been widely accepted, dynamic efficiency of the overall payment system is influenced greatly by the mix and variety of payment instruments (cheques, direct entry credit and debit, consumer electronic and high-value payments), apart from the operational efficiency of individual clearing systems. Against the background discussed above, it is likely that certain types of electronic payment instruments, especially debit card, tends to be the preferred form of product innovation in the period ahead.

---

<sup>24</sup> Potential benefits associated with the increased use of more efficient electronic payment systems tend to receive strong support from the recent study by Humphrey, Pulley, and Vesala (1996). According to the mentioned study, it is suggested that a 6.8% rise in non-cash transactions is associated with a 10% reduction in the real value of cash holdings using the cross-section analysis across 14 developed countries.

Table 12  
POS transaction in the Netherlands in 2003

Payment product	Number	Value	Average transaction amount(EUR)
Cash <sup>1</sup>	84.0	52.7	10.0
Electronic purse	0.5	0.1	3.5
Debit card	14.5	41.7	46.0
Crdeit card	0.9	5.2	91.0
Euro cheque/giro cheques <sup>2</sup>	0.1	0.3	77.0
Total	100.0	100.0	16.0

1. The Bank's own calculations

2. Withdrawn as of 1 January 2002

3. In percentages unless otherwise indicated

Source: De Nederlandsche Bank (2002)

#### *4.4 Encouraging the exploitation of scale economies and network externalities*

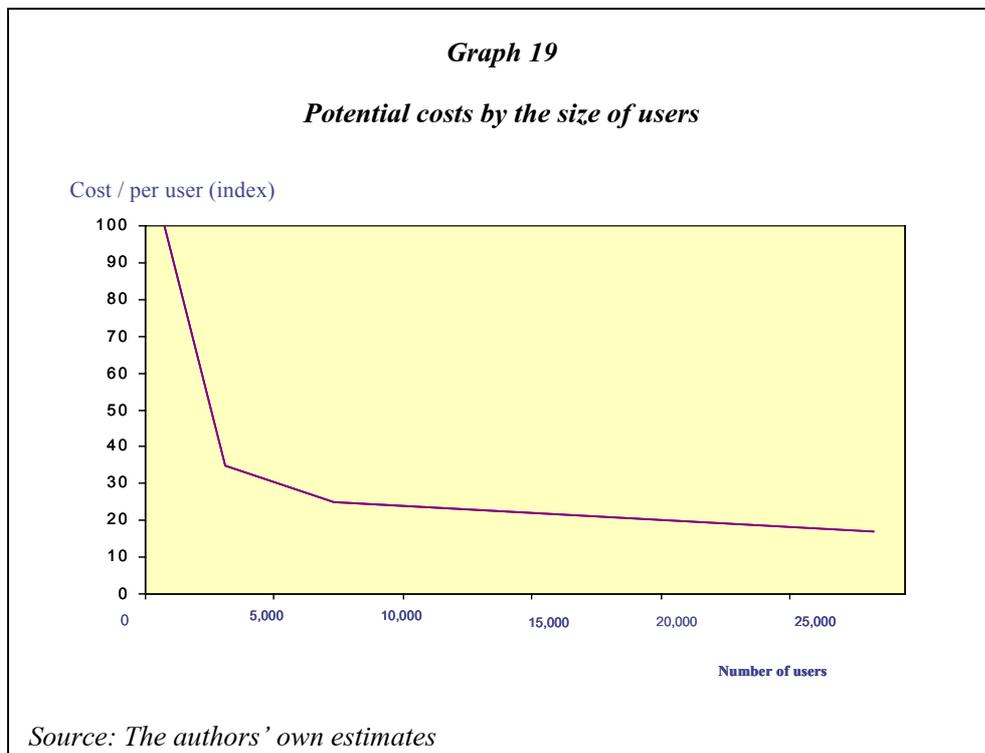
Based on empirical evidence discussed in the previous sections, it has become clear that Thailand is still largely a cash and paper-based payment society, a situation similar to the case of most countries in the Asian economies except those in Japan and Singapore. As discussed earlier, most electronic payments instruments have not well established in Thailand, despite the fact that this sort of payments instruments have been claimed to be more cost-effective instruments. As shown in Graph 10, the use of some forms of electronic payments instruments, especially those related to debit cards and electronic funds transfers in terms of ORFT, can be characterized as in the infancy stage, when compared with the degree of development and usage for this particular types of retail payments in many other countries such as the Netherlands.

The analysis in the previous sections also suggests that there seems to have an undesirably low rate of innovation in electronic payment instruments in the case of Thailand, as it appears that credit card has been by far the only established form of electronic payment instrument for retail transactions. Moreover, as discussed earlier, other types of electronic payment instruments that have been extensively used in many countries have been virtually little role to play in retail payments transactions, especially those of debit card, EFTPOS.

As innovation and development of new products are important driving forces behind increased efficiency in the payment system, the BOT has important roles to play to achieve this end. Of the such roles that can contribute to more efficient retail payment system include: encouraging exploitation of economies of scale and network externalities through the increased interbank co-operation as well as innovation in appropriate (retail) payment instruments.

*Exploitation of economies of scale and network externalities through interbank co-operation.* Experience in many countries suggests that the production of (certain types of) payment services needs to have economies of scale and network externalities. This is particularly so in the case of the electronic payment services. As has been widely accepted, the reason why co-operation that encourages installments of electronic payment technology is beneficial for

participants in the joint systems can be generally divided into *cost benefits* (scale economies) and *customer benefits* (network externalities in terms of wide acceptability and compatibility). The idea along this line is reflected in part from Graph 19.



To ensure that economies of scale and network externalities are exploited at the early stage in the process of launching a new product, price charged to that product needs to be lower than the direct costs (production cost). Since price affects demand, a low price can contribute to extensive use of service at an early stage. The increased use of the payment service implies that the utility for each individual system user increase when additional users join the system. This is often referred to as network externalities. The EFTPOS system, a system for card payments in electronic point-of-sale terminals) is probably a good example for the network externalities. As one can see, increased card use leads to growth in the number of payment terminals that in turn provides the basis for increased card use.

Due to scale economies and network externalities, it appears that in payment systems a high degree of cooperation between service providers and/or market operators may give rise to

more efficiency in the payment system. In some countries where the banking sector is dominated by a few banks like in Finland, cooperation among service providers may be easier to accomplish than when the market is more diverse. However, this may be not the case for Thailand where the market is quite fragmented. Large difference in the size of the commercial banks in Thailand's case has been seen as another factor inhibiting the degree of success of such a co-operation.

As is commonly the case, free-rider problem generally arises in case where the banking structure is asymmetric, i.e. there are both small and large banks. Under this situation, small banks can be usually able to obtain larger benefits from cooperation than are large bank. The establishment of a cooperative payments ATM network is a good example in this regard. Under the mentioned system, small banks have been claimed get benefits more than large banks, since small banks can offer available services to their customers at a relatively wider scale that they would not otherwise have been able to provide and hence can exploit scale economies associated with electronic payment services. Under this situation, if the large banks are unable to price access to compensate for their loss of competitive advantage, they have greater incentives to invest on their own and to exclude smaller banks from the system.

## 5. Conclusions and implications for efficiency improvements in the retail payment system

Empirical evidences reported in this paper have shown that there have not many changes in the use of different payment methods in the case of Thailand over the past decade or so. The Thai retail payments systems have still been dominated by cash and cheque, while electronic payment instruments have been found to have a relatively limited role over the same period. Cash and cheque encompass a significant share in the total retail payment in Thailand. As can be seen from several indicators of cash usage, it is evident that cash payments remains one of the most popular form of retail payment in Thailand, accounting for around 9% of GDP over the years 2000-2002.

However, as pointed out in the paper, the use of cash-to-M1 ratio tends to provide an overestimation of the actual cash usage in the retail payment in Thailand, especially when compared with the other two indicators of cash use: cash-to-M2 and cash-to-GDP. Despite such conflicting results among different kinds of indicators, cash-to-M2 and cash-to-GDP have been claimed to provide a more reliable estimation of the behavioral pattern of cash usage in Thailand due partly to a number of drawbacks associated with cash-to-M1 ratio as cited in the paper.

The finding that *cash usage* has not been declining over the past decade has provided a number of important implications for the search for more efficiency in the retail payment system of Thailand.

➤ First, it indicates that a substitution process toward the use of electronic point-of-sale payments, especially debit card payments, appears to have proceeded with a slow progress. This seems to be no surprise as the recent evidence has shown that debit card payments constituted only a negligible amount in the non-cash payment in Thailand, while this sort of payment instrument has been popular in most of the European countries, especially in Norway where the share of debit card payments was about 35% of the non-cash payment.

➤ Second, as pointed out in the paper, the high ratio of cash usage of around 9% of GDP has been largely related to the existence of an extensive ATM network in Thailand, which enable the consumers to gain an easy access to the ATM terminals and also make it more lower cost for commercial banks in supplying traditional services to their clients.

➤ Third, the paper also points out that the limited use of some form of payment instruments and services, especially debit card, coupled with the extensive network of ATMs terminals, has resulted in the increased use of paper-based payment instrument, especially cash instead of reducing them.

➤ Fourth, the social cost of cash, excluding opportunity costs, for the case of Thailand is estimated to be in an approximate range of 19-35 billion bath in 2002, or equivalent to 3%-6% when compared with the total value of currency in circulation in the Thai economy over the same period. This implies that substantial cost savings for the Thai economy as a whole can be gained if efforts and/or initiatives to encourage the increased development of cash substitution process are of particularly successful.

Apart from the finding that cash continues to be one of the major means of retail payment in Thailand, the paper also finds that cheques continue to play an important role in the Thai payment system. As discussed, cheques have played the prominent role among the class of non-cash payment instruments. Cheque use represents around 85% of the value of non-cash payments. There tended to be not much change in the pattern of cheque usage in the face of competition from some types of newer payment instruments, in particular credit card and fund transfer through direct debit/credit mode of payments.

As pointed out in the paper, cheques appear to have played the prominent role in the period ahead for several reasons. First, there tends to be no intensified competitions from other classes of newer payment services, especially those of electronic payments instruments such as credit cards and direct debit/credit payments. The former accounted for only 1% of the total value of payments, while the later continued to account for only 1.9-3.1% of non-cash payments

over the years 2000-2002. Second, the other instruments are viewed not as close substitutes, but rather as different types of goods, not in direct competition. Third, costs of check payments and costs of other non-cash payment instruments tend to be not large enough to encourage the use of other non-cash payment instruments, when compared with the benefits received from the use of checks. As discussed, the introduction of the B/C 3 Day project tends to have lowered the cost of processing to some certain degree. Four, the level of cheque usage in Thailand appears to be reasonably low if one considers in terms of the number of cheques written per capita. As discussed, Thailand has an average of 1.5 cheques per capita each year while the United States still has a payment system dominated by cheques with an average of 237 cheques per capita each year.

In contrast to the behavior of cash and cheque usage, there seems to have an undesirably low rate of innovation in electronic payment instruments in the case of Thailand, as it appears that credit card has been by far the only established form of electronic payment instrument for retail transactions. Moreover, as discussed earlier, other types of electronic payment instruments that have been extensively used in many countries have been virtually little role to play in retail payments transactions, especially those of debit card, EFTPOS. As innovation and development of new products are important driving forces behind increased efficiency in the payment system, the BOT has important roles to play to achieve this end. Of the such roles that can contribute to more efficient retail payment system include: encouraging exploitation of economies of scale and network externalities through the increased interbank co-operation as well as innovation in appropriate (retail) payment instruments.

The paper has also discussed and explored ways to encourage the *medium-term* and *long-term efficiency* of the retail payment systems in Thailand.

➤ First, as can be alluded to from overseas and local experiences, the use of direct pricing of payment services can be seen as an additional factor contributing to more efficiency in the retail payments system, as it can be used to influence consumers' choice of payment instruments by guiding the customers to use a more efficient payment instrument. However, as

discussed earlier, there are several issues for concerns in the move towards the increased reliance on direct pricing strategy to encourage the shift toward a more cost-effective instrument for Thailand in the period ahead.

One of such concern is the accurate measurement of the cost of acquiring different type of retail payment instruments and servicing end-users. As there seems to be insufficient data on the costs of producing payment services in Thailand, it is therefore not a simple task to make an accurate appraisal of efficiency in retail payment at this stage. Another issue concerns the possibility that, in making the choice of different types of payments, pricing factor alone seems to be not strong enough to encourage the shift to electronic payments instruments that have a relatively lower cost for payments in the retail transactions. Cheque and credit cards are examples of payment instruments where customer convenience increased demand, leading to a high growth of volume despite higher costs of processing than alternative instruments. As such, the use of direct pricing strategy in the case of Thailand may have to focus on some certain types of electronic payment instrument, in particular credit cards and ATM-debit cards. This is particularly so because some other payment cards (e.g. debit cards) have been not well developed. The final issue concerns the best pricing method for use in the determination of appropriate prices or fees for various payment services, particularly those of Explicit transaction-based and account-based pricing” .

➤ Second, it can be carried out in part through the exploitation of new technology to handle the cheque collection and processing in electronic form. As discussed, the use of pricing strategy, by offering the lower price incentives for the use of relatively lower cost payment instruments in terms of electronic-based payment instruments, has been just part of the solution to gain further enhancement of efficiency in retail transactions. However, experience in overseas countries suggests that other non-price factors tend to be of equally important in influencing the consumer payment preference in the use of different types of payment instruments. Such factors as convenience, reflected in part by the existing of an extensive ATM network, has been considered to be a good example in this regard.

➤ Third, as pointed out in the paper, the ratio of cash to GDP for Thailand have maintained at a relatively high level of around 9% over the past many years. It is likely that the level of cash usage in Thailand may have increased in the near future should the implementation of Cash Center project has become fully operative. The establishment of the Cash Center, as it can be argued, may encourage cash usage in that branches of commercial banks operating in the vicinity of the respective Cash Center tend to have higher demand for cash holdings.

The tendency of the higher demand for cash holdings by branches of commercial banks along with the relatively high ratio of the present level of cash usage provides important implications for the BOT in its attempt to further enhance the level of efficiency in retail payments by encouraging the greater use of electronics-means of payments, especially those of debit/credit cards, e-money, e-purse, in retail transactions. As part of a solution for this, it is proposed that the rate of growth for the cash usage needs to be limited at some particular levels deemed to be relevant to the state and degree of development of the Thai economy as the whole. More specifically, it should be maintained at the level not greater than 9% of GDP for the years 2004-2006. Such the target level needs to be gradually reduced to the level not greater than 8.5% of GDP for the years 2007-2009.

➤ Fourth, the increased use of fund transfers through ORFT has been seen as an additional area that can contribute to the declining in the use of cash in the near future. As alluded to in the text, fund transfers through the use of ATM under the ORFT system tend to have gained higher acceptance from the end-users (due in part to the increased confidence of end-users), as reflected in the increased amount of the fund transfers through this channel. To gain further encouragement of using the ORFT system as part of a channel to reduce the cash usage, several improvements need to be carried out. These include (i) the appropriate setting of the fees involved in using this type of fund transfer instrument aiming to increase the level of fairness among market participants, (ii) the possible increase of the ceiling from the present level of 20,000 baht per transaction to an approximate level of 50,000 baht per transaction.

➤ Fifth, another area of developments and challenges is related to *“the system development for payment and e-commerce transactions”*, especially in the area of “the setting up a joint platform for dealing with payment and e-commerce transactions. The BOT and a number of commercial banks is currently in the process to set up a company to run an “Inter-bank Transaction Management and Exchange” (ITMX) system, which will provide a core inter-bank infrastructure to support a payment system and e-commerce. The primary objectives of the introduction of the ITMX are to provide an infrastructure for e-commerce transactions, to reduce duplicate investment, and to offer an efficient service for payments between banks and their customers.

Until now each bank has run its own systems for payment and e-commerce transactions. However, as it is commonly agreed, the introduction of the ITMX will enable banks to run on the same platform. In particular, the ITMX will be a center for transactions and settlement management. Apart from these, the newly designed system will enable customers to do electronic transactions and also support online transaction processing. As the setting up of the ITMX has been based on an open platform and defined standard messaging for inter-bank transactions, the new system will also support cross-border transactions in the near future. By this year, the BOT’s Payment System Committee and the sub-committee on payment facilitation will conclude its work. The ITMX project is expected to launch its first operation in early 2005.

Sixth, greater emphasis needs to be given to the development of certain types of (product innovation) electronic payment products that are considered to be close substitutes for the cash (and cheque) usage. In particular, more effort needs to be done to facilitate the use of debit cards in on-line transactions. For ease in actual application, it is proposed to encourage the use of debit cards in the form of modification of ATM card. The use of such instruments would clearly expand electronic payment capabilities (over the internet) to those with bank accounts who do not hold credit cards. However, as alluded to, there are a number of issues to be considered in the move toward the greater use of electronic means of payments in retail transactions in Thailand.

## References

- Annual Report on Payment System**, Norge Bank (various issues)
- Annual Report on Payment System**, Reserve Bank of Australia (various issues)
- Bank for International Settlements** (1999), *Retail payments in selected countries: a comparative study*, Basel, Switzerland, March.
- Bank for International Settlements** (2003), *Policy issues for central banks in retail payments*, Basel, Switzerland, March.
- Bank of Thailand** (2000), *Payment systems pricing and usage*, a joint study by the Bank of Thailand and Thailand Development Research Institute, Bangkok.
- Chakravorti, Sujit, and Timothy McHugh** (2002), “Why do we use so many checks?,” *Economic Perspectives*, Federal Reserve Bank of Chicago, Third Quarter.
- De Nederlandsche Bank** (2002), *Annual Report on Payment System*
- Federal Reserve Bank of Boston** (2003), Federal Reserve Bank of Boston Press Release on February 6, 2003 entitled Federal Reserve Banks Announce Changes to Increase Efficiency in Check Service (<http://www.bos.frb.org/news/pdf/fspc02603.pdf-02-06-03>).
- Food Marketing Institute** (2000), *It all adds up: an activity-based cost study of retail payments*, Washington, DC.
- Leinonen, Harry** (2001), “Developments in retail payments”, *BIS Papers*, No. 2, pp. 61-68.
- Leinonen, Harry** (2003), “*Finish payment systems: structure, efficiency, and development*”, background paper prepared for Consultation for payment and settlement simulation for Thai payment system, Payment Systems Group, Bank of Thailand, October 6-8
- Norge Bank** (2002), “Banks’ costs and income in the payment system in 2001”, *Economic Bulletin*, Vol. LXXIII, pp. 125-133.
- Pariwat, Sayan and Rungsun Hataiseree** (2002), “Risk Reduction in the Payment System and the Role of the Central Bank: Thailand’s Recent Experience”, *Bank of Thailand Quarterly Bulletin*, Vol. 42, No. 4, pp. 59-95 <<http://www.bot.or.th/>>
- Pariwat, Sayan and Rungsun Hataiseree** (2003), “Managing payment and settlement system reform: a Thai perspective”, Bank of Thailand, Payment Systems Group Working Paper No. 2, September <<http://www.bot.or.th/>>

- Stavins, Joanna** (2001), “Effect of consumer characteristics on the use of payment instruments”, *New England Economic Review*, pp. 20-31.
- Humphrey, David B. and Allan Berger** (1990), “Market failure and resource use: Economic incentives to use different payment instruments,” in *The U.S. Payment System: Efficiency, Risk and the Role of Federal Reserve*, David B. Humphrey (ed.), Boston: Kluwer Academic Publishers, pp.45-56.
- Humphrey, David et al.** (1996), “Cash, paper, and electronic payments: a cross-country analysis”, *Journal of Money, Credit and Banking*, Vol. 28, No.4, pp. 914-939.
- Humphrey, David B. et al.** (2000), “The check’s in the mail: Why the United States lags in the adoption of cost-saving electronic payments”, *Journal of Financial Services Research*, Vol. 17, No.1, February, pp.1-39.
- Humphrey, David B. et al.** (2001), “Realizing the gain from electronic payments: costs, pricing, and payment choice”, *Journal of Money, Credit, and Banking*, Vol. 33, No.2, May, pp.216-234.
- Springer, Joh** (2000), “Can debit card use is on the rise,” [www.icsc.org/srch/sct/current](http://www.icsc.org/srch/sct/current).
- Thailand’s Payments Market Overview (2003)**, Payment Systems Group, Bank of Thailand
- Van Hove, Leo** (2001), “The price of cash: on a report for Dutch retail association”,
- Wells, Kirstin E.** (1996), “Are checks overused?”, *Federal Reserve Bank of Minneapolis Quarterly Review*, pp. 2-12.