

# **Occasional Paper**

โครงการสำรวจพฤติกรรมการชำระเงินประชาชน โดยการบันทึกการใช้จ่ายประจำวัน (Payment Diary) ประจำปี 2566

ธันวาคม 2566





# Contents

ntroduction	2
Executive Summary	3
1. Fact Findings	4
1.1 Payment Instrument Usage	. 4
1.2 Payment behavior in specific circumstances	. 5
2. Findings from the Statistical Models	6
2.1 Analysis Results on Factors Influencing Payment Behavior	. 6
2.2 Analysis Results on Factors Influencing Payment Payment Intention	. 7
3. Cash Usage Behavior	10
3.1 Cash Holding	10
3.2 ATM Usage Behavior	10
3.3 Online Shopping Behavior	11
4. Consumer Classification Based on Behavior	12
5. Problems and Challenges of Using Digital Payment	13
6. Thailand's Attitudes Towards Less-Cash Society	13
7.Implications for Policy Implementation	15
References	16



#### Introduction

The Bank of Thailand (BOT) has launched the Consumer Payment Diary Survey Project, also known as "Payment Diary" (the project), to examine data on the consumers' payment behavior and affecting psychological factors from their payment diaries. The project has for the first time in Asia applied the Payment Behavior with Socio-Psychological Factors model developed by Cruijsen and Horst (2019) in order to obtain more detailed and accurate data than ones collected by using the traditional survey method. In addition, the Payment Diary is recognized as a reliable tool having been opted for by various central banks worldwide.

This study comprises 3 parts, the first and the second parts are quantitative researches conducted through the face-to-face and telephone interviews whilst the third part is the qualitative research in form of in-depth telephone interviews. The total of 6,090 participants were distributed by gender, age, monthly income, and area of residence covering 7 regions nationwide, namely Bangkok and its vicinities (Nonthaburi, Samut Prakan, and Pathum Thani), the North (3 provinces), the North-East (7 provinces), the Central (4 provinces), the East (3 provinces), the West (2 provinces), and the South (6 provinces).

The survey was conducted in April – July 2023 by using 3 questionnaires to collect different data. The first questionnaire is about Socio-Psychological model. The second questionnaire is related to Payment Diary. Data on perceived attributes and opinion about ATM fee were collected using the third questionnaires.

The BOT has worked on this project to gain in-depth data on the consumers' payment behaviors to identify the target groups as well as the guideline on digital payment promotion, and to further develop digital payment services that suit each target group. These activities are in accordance with the goals stipulated in the Payment Systems Roadmap No. 5 (2022-2024), including planning effective banknote management and the deployment of vital data for in-depth analyses and policy formulation consistent with the consumers' behavior in the future.



#### **Executive Summary**

The survey reveals that the majority of the Thai citizens still paid in cash, in the proportion of cash payment and electronic payment 66:34. Their cash payments were usually used for small-value purchases of daily consumption at small and medium stores. Regarding the electronic payment, the economy witnessed a rising trend and mobile banking was the most popular payment instrument, with the proportion of usage of 28% especially for utility bill payment. Nevertheless, the usage of Pao Tang, the government's mobile application, decreased after the government stimulus packages were terminated. In addition, examples of the socio-psychological factors that affected the consumers' decision making on payment instrument were acceptance/needs of the business partners and the surrounding people's behavior.

As the cash payment is recently projected to decline and this trend is also foreseen to continue in the long term, electronic payment is therefore likely to increase and replace the mentioned traditional means of payment since the consumers' behavior and attitude about payment instruments alter in line with their surroundings. Also, the country's adaption to less-cash society is expected within 5 years.

However, the main obstacles to the electronic payment are insufficiency and uneven distribution of points of electronic payment receiving service, less convenience compared with cash payment, fear or worries about technology adoption, safety, and frauds. Thus, strategies to promote the electronic payment use should be ones that eliminate such pain points; for instance, increasing the number of points of electronic payment receiving service at small and medium stores, more technology adoption to facilitate small-value electronic payments, elevating the confidence with the process to check the accuracy of payment received, ensuring safety as well as creating comprehensive electronic payment ecosystem for all stakeholders, including the citizen, business and government sectors.

The findings obtained from the mentioned survey and study will benefit promoting electronic payment to become the main payment option in the future that suits the target groups. They are also essential for in-depth strategy planning and policy formulation. A series of payment diary surveys will help monitor and empirically observe these expected developments.



## 1. Fact Findings

#### 1.1 Payment Instrument Usage

The findings obtained from 6,090 respondents surveyed in April – July 2023 on the consumers' payment behavior can be summarized as follows:

With a total of 77,849 transactions during the study period, the proportions of respondents making cash payment and electronic payment were 66% and 34% respectively. The average number of transactions was 64 transactions / person / month, consisting of 41 cash transactions and 23 electronic transactions. The following are consumers' payment behaviors classified according to type of payment instrument:

**Cash**: Cash remained the Thai consumers' main payment instrument, accounting for 66% of total transactions. It was usually used for small-value purchases, with an average of 212 Baht per transaction. In addition, almost all spending categories had the highest proportion of cash payment when compared to other means of payment.

**Mobile/internet banking:** Mobile/internet banking was the most popular electronic payment instrument, accounting for 28% of total transactions with an average of 400 Baht per transaction. The utility expense had the highest proportion of mobile/internet banking usage.

**E-wallet** (exclusive of the government's Pao Tang mobile application): The usage accounted for 2.5% with an average of 221 Baht per transaction, approximately equal to that of cash transaction.

**Debit card/ATM:** The usage accounted for 2% with an average of 804 Baht per transaction.

**Credit card:** The usage accounted for 1% and was mainly used for high-value transactions with an average of 1,293 Baht per transaction.

**Pao Tang mobile application:** The usage declined to only 0.5% as a result of the termination of the government projects.



#### figure 1: the proportion of payment instrument usage figure 2: average spending/ person/ transaction





#### 1.2 Payment behavior in specific circumstances

Pao Tang mobile application: Most of respondents who used to use the application informed that they used Pao Tang for utilizing the government stimulus package and other services such as digital lottery purchase, money transfer/e-wallet top-up and bill payments. However, the Pao Tang usage was on a declining trend after the government projects terminated but is likely to resume if there are new projects or the previous or prevailing ones are extended.

figure 3: reasons for giving up using "Pao Tang" figure 4: reasons for resuming using "Pao Tang"



Using public transportation: Considering only respondents in Bangkok classified by types of transportation taken in their daily lives, 63.9% of the respondents used their private cars, and 89.6% of whom had taken the intercity expressways. With regard to the payment instruments to pay for toll fees, 59.2% paid by Easy Pass/ M-Pass, topping up their Pass using credit cards by 63.9% and mobile banking by 36.1%. Next, 35.9% paid in cash and only 4.9% 4.9% used debit/credit cards.

For those taking BTS/ MRT or buses, prepaid cards were the most popular payment instruments accounting for 42.4%, followed by cash at 39.4%. Furthermore, mobile banking and debit/credit cards were used by 13.6% and 4.5%, respectively. This shows that the people have become more familiar to using digital payment for the public transportation.



## 2. Findings from the Statistical Models

The Payment Behavior with Socio-Psychological Factors model developed by Cruijsen and Horst (2019) was applied in this study to structure the questionnaire, set the sequence of questions, and develop the questions.

The model uncovers the relationships between variables. That is, payment behavior was correlated with personal characteristics and three key factors, namely payment intention, habit, and actual control. The model was applied to study payment behavior through 2 payment channels/methods:

- Cash payment: This comprises banknotes and coins (hence the need for cash holding)
- Electronic payment: Examples are pre-paid card, credit card, debit card, funds transfer via ATM or mobile application.



figure 5: Model of Payment Behavior with Socio-Psychological Factors\*

Note: \* source: Cruijsen, C. & Horst, F. (2019). Cash or Card? Unraveling the Role of Socio-Psychological Factors. De Economist (167), Page 145-175, De Nederlandsche Bank

## 2.1 Analysis results on factors influencing payment behavior

## 2.1.1 Key variables relating to

#### figure 6: Impact on Payment Behavior

## payment behavior

Applying ordinal logistic regression to analyze 3 key factors, namely payment intention, habit and actual control, the results can be summarized as follows:

 Payment intention: It influenced payment behavior with a statistically significant coefficient of 1.23

**2.) Habit:** There was no influence on payment behavior

**3.) Actual control:** There was no influence on payment behavior



Note: 1 Numbers in parentheses indicate the coefficients of the main variables influencing payment behavior 2\*\* Statistically significant level of 0.05 and 3\* Statistically significant level of 0.10



#### 2.1.2 Personal characteristics relating to payment behavior

- Gender: There was no influence on payment behavior

- Age: The respondents aged 46 years and older made more cash payment than the younger ones.

- Income: The high-income earners used more digital payment than their lower-income counterparts.

- Source of income: The respondents whose salary was paid in cash made more cash payments than those receiving salary through the digital methods.



2\*\* Statistically significant level of 0.05 and 3\* Statistically significant level of 0.10

- Education: The digital payment was more used by the respondents having earned a bachelor's degree or higher than those with lower level of education.

#### 2.2 Analysis results on factors influencing payment intention

#### 2.2.1 Key variables relating to payment intention

The result suggests that payment intention affected the respondents' different payment behavior. The respondents' decision to opt for cash or electronic instrument depended on 2 variables, which are attitude and socio-psychological factors. They influenced payment intention at a statistical significance level of 0.05. The analysis was explained in more details through 7 sub-variables which impact payment intention as follows:



Note: 1 Numbers in parentheses indicate the coefficients of the main variables influencing payment intentic 2\*\* Statistically significant level of 0.05 and 3\* Statistically significant level of 0.10 1) Attitude: The survey participants having positive attitude towards cash payment also paid for purchases in cash in real life. Similarly, those having positive attitude towards digital payment used digital instruments more than other means. Perceived attributes, namely speed, safety, ease of use, convenience, inexpensiveness, budget control, privacy, and merchants' acceptance, have impacts on attitude, with a statistically significant coefficient of 0.21



**2)** Individuals' perception and understanding (injunctive norms): The respondents chose a payment method according to their perception of payment methods accepted by payment receivers (seller/PoS/partner). Injunctive norms influenced the payment intention with a statistically significant coefficient of 2.48

**3)** Close contacts' behaviors (descriptive norms): The influence on choosing a payment channel, through perception and understanding of whether the respondents were interested in imitating payment behavior of a person or groups of persons they know, was examined. The result shows that descriptive norms affected the payment intention with a statistically significant coefficient of -3.17. The inverse relationship was found regarding the close contacts' behaviors, i.e. the respondents would behave in the opposite way to that of their close contacts.

**4)** Behaviors of people with similar attributes (roles): The influence on choosing a payment channel, through perception and understanding of whether the respondents were interested in imitating payment behavior of groups of persons with similar attributes, for example, age, income, and lifestyle, was examined. The survey uncovers roles had an impact on the payment intention with a statistically significant coefficient of -1.05. The inverse relationship was found regarding behaviors of the people with similar attributes, i.e. the respondents would behave in the opposite way to that of the mentioned group of people.

**5)** Opinion about possibilities of payment channels' accessibilities (personal norms): The respondents' opinion about whether payment channels can be accessed anytime, anywhere was taken into account. If the survey participants deem that accessing cash payment anytime, anywhere is more likely than the case of digital payment, they will opt for cash as their main payment channel. The result indicates that personal norms influenced the payment intention with a statistically significant coefficient of -0.04.

6) Sentiments on payment channel (feelings): Comparisons of a number of sentiments, consisting of pleasant, safe, familiar, modern, valuable and simple, on payment channels were made. The study reveals that feelings affected payment intention with a statistically significant coefficient of 0.66. Taking each mentioned sentiment into consideration, if a respondent "feels better" to pay for purchases with cash than with a digital instrument, he or she will use cash as the main payment channel.

7) Perception of the future constraints on payment channels (perceived control): The perception of the future constraints to payment channels was considered by comparing the possibilities of future usage of the 2 payment channels. It was found that perceived control influenced payment intention with a statistically significant coefficient of 0.26. If a person sees that the future constraints on cash payment are "fewer" than chances to use digital payment, that person will mostly use cash to make purchases.



#### 2.2.2 Personal characteristics relating to payment intention

figure 9: Impact on Payment Intention



- Gender: Males had higher intention to pay with cash than females.

- Age: Respondents aged 56 years and older had higher intention to pay with cash than the younger ones.

- Income: The middle and high-income earners had higher intention to use more digital payment than their low-income counterparts.

- Source of income: The respondents whose salary were paid in cash had higher intention to make cash payments than those paid through the digital methods.

- Education: There was no influence on payment intention.

The mentioned factors which have influences on payment behavior will be used as vital data for policy formulation and implementation to promote digital payment to become the consumers' main payment option in the future.



## 3. Cash usage behavior

## 3.1 Cash holding

figure 10: Cash holding (average amounts in Thai Baht per person per day)



Remark: \*Bkk+ = Bangkok and its vicinities

At present, cash is the Thai citizens' main payment instrument for daily spending. According to the data obtained from the survey, an average amount of cash held by respondents was 2,122 Baht per person per day. More details can be classified as follows:

- Gender: Males and females held similar amounts of cash

- Age range: Those belonging to an old age range held more cash than other groups. Respondents aged 55-65 years held an average amount of 2,335 Baht per person per day, the highest amount among all age ranges.

- **Income:** The highest-income earners held more cash than other income groups.

- Resident location: The survey participants residing in Bangkok and its vicinities held the highest amount of cash per day, at an average amount of 2,376 Baht. By contrast, those living in Southern Thailand were reported the lowest amount of daily cash holding at an average amount of 1,748 Baht.

#### 3.2 ATM usage behavior

#### 3.2.1 ATM usage in daily life

- ATM usage behavior: 99.9% of the respondents had bank accounts, and 79.4% of whom occasionally visited the bank branches. As for cash withdrawal from the ATM, 63.1% had an exact number of times to withdraw cash, at an average of 3.6 times per month (not exceeding a number of free withdrawal transactions allowed). 72.6% had an exact amount of money to be withdrawn from the ATM, at an average of 2,595 Baht per time.

- main cash withdrawal channel: 65.2% of the respondents having bank accounts used ATM/ debit / credit cards to withdraw money from ATM.

- distance and time spent for going to withdraw cash: 51.9% started their journey to an ATM from their house/accommodation. The distance to the ATM was less than 5 kilometers in most cases which took 10.2 minutes on average.



#### 3.2.2 Attitude towards ATM fee

The result obtained from the survey suggests that should ATM fee rise, there will be changes in ATM usage behavior, which are controlling number of times to withdraw cash not to exceed a number of free withdrawal transactions allowed, increasing amount of cash withdrawn per transaction, paying for purchases with digital instruments more often, and visiting the bank branch for commission-free cash withdrawals. Therefore, a rise in ATM fee is considered to be an effective factor to encourage consumers to increase their digital payment.

#### 3.3 Online shopping behavior

81.1% of the respondents had experiences in online shopping with different payment methods. 35.3% of these online shoppers paid on purchase via application or website, and 64.7 % paid on delivery. The payment methods can be sub-classified as follows:



figure 12: Reasons to opt for cash on delivery

figure 11: Online shopping behavior

56% of the respondents having experiences in online shopping used digital payment to pay for their purchases while 44% opted for cash on delivery.

For the pay on delivery, there were both consumers who paid with cash and those who used digital payment.



The most popular reason for cash on delivery was concern about merchant fraud. Next was lack of confidence with the system and concern about theft.



## 4. Consumer classification based on behavior

Payment behavior segmentation of survey participants was conducted using data on all transactions obtained from payment diary (exclusive of transactions through Pao Tang application) and applying K-mean clustering to classify segments into cash and digital payment transactions. The survey participants were classified into 4 following groups:

figure 13: Payment Behavior Segmentation						
Medium of Exchange	Mostly pay by E-Payment	<ul> <li>(What they use as Medium Of Exchange)</li> </ul>		Mostly pay by Cash		
Segmentation	Digitizer	Almost Convinced	Give It A Try	Old Schooler		
2023 Sample size N = 5,220 (Without Pao Tang Application)	938	1,141	1,329	1,812		



#### figure 14: Number of Purchase by Spending Value and Medium of Exchange

**Digitizer:** accounting for 17.9% of survey participants. They are consumers who use only digital payment and those who pay for most of their purchases digitally. They made 70 transactions per month on average, consisting of 13 cash transactions (18.6%) and 57 transactions through digital payment (81.4%)



Almost convinced: accounting for 21.8%. They are consumers who regularly use digital payment in daily life, but not as frequently as the digitizer. Consumers belonging to the almost-convinced group made 64 transactions per month on average, consisting of 31 cash transactions (48.4%) and 33 transactions through digital payment (51.6%)

**Give it a try:** accounting for 25.5%. They also use digital payment in daily life, but less frequently than the almost convinced group. The give-it-a-try consumers made 66 transactions per month on average, consisting of 48 cash transactions (72.7%) and 18 transactions through digital payment (27.3%)

**Old schooler:** accounting for 34.7%. The old schoolers are consumers who regularly use cash in daily life, comprising those who by no means pay digitally and those who pay for most of their purchases with cash. They made 59 transactions per month on average, consisting of 56 cash transactions (94.9%) and 3 transactions through digital payment (5.1%)

## 5. Problems and challenges of using digital payment

The problems and challenges that adversely affect the consumers' adaption with regard to using digital payment can be derived from the result of the survey as follows:

1. insufficiency and uneven distribution of points of digital payment receiving service: Most of small and medium stores, especially in remote areas, still only or mainly accepted cash. Moreover, a number of stores stipulated the minimum amount for digital payment or merely accept particular digital wallet payments.

**2. less convenience in comparison with cash**: For small-value purchases, cash payment was considered to be quicker than digital payment which requires more procedures on both consumers and sellers' sides.

**3.** Users' fear / concerns about digital payment usage: Users were afraid of being deceived as they are not familiar with using technology. They are also concerned about inaccurate transfers, unsafety of the system and data being stolen.

## 6. Thailand's attitudes towards less-cash society



figure 15: Readiness to become less-cash society



According to the survey on attitudes towards Thailand's readiness to become lesscash society, 81.1% of the respondents viewed that Thailand was likely to be ready to become the less-cash society within 5 years, and 91.4% estimated the country to achieve the mentioned milestone within 10 years.

With regard to the respondents' readiness to mainly use digital instrument in daily life, 89.2% assessed themselves to be ready to do so within 5 years, and 93.7% anticipated that they will be ready in 10 years' time.

In addition, 92.8% assessed themselves to use digital instrument in daily life in various places for different purchases within 5 years, which is in line with their self-assessment on the overall readiness.



## 7. Implications for Policy Implementation

The BOT takes into account data on the consumers' in-depth payment behavior obtained from the survey to deploy for promoting digital payment and reducing the cost of the payment system. Examples are categorizing the target groups and stipulating the guideline to boost digital payment usage, furthering the services that suits the consumers' behaviors in each group through popular channel such as mobile banking, attempting to enhance usage of prevailing fundamental structure such as a large number of debit cards and credit cards, and closing the gaps found from the study, an example is cash mainly being used for small-value purchases - for instance lower than 300 Baht (small ticket size), insufficient points of electronic payment receiving service, or lack of confidence with safety to use electronic payment instrument.

With regard to policy entrepreneurship, this can be proceeded through the combined payment instruments. That is, based upon card payment as there are already a considerable number of cardholders in the country and QR code scanning on mobile banking services which currently gain high popularity, technology such as card (Tap n Go) can be combined to facilitate consumers and help expand distribution of points of electronic payment receiving services to small and medium stores, with an opportunity to further develop to Mobile Tap n Go on the next step. The other 2 prospective policies are increasing roles of service providers in accordance with the conditions of open infrastructure and open competition to allow the potential service providers to offer more targeted services to particular groups, and enabling the payment system to be interoperable so as to support innovation and provide an opportunity for extensive competition among all players.

To alleviate the adverse effects from the mentioned gaps, for increasing confidence, the policy will focus on adding features on the applications to ensure the accuracy of the amount received, enable the stores to amend the erroneous transactions conveniently and promptly, and also increase consumers' skill to self-prevent frauds with respect to digital payment usage.

For the meantime, cash transactions in the country remains high, with several remote areas and groups of consumers needing to pay for purchases with cash. It is therefore necessary to raise the efficiency in the country's cash management together with the strategy to boost digital payment usage, putting an emphasis on reducing overlaps and supporting to share resources as much as possible.



#### References

- Cruijsen, C. and Horst, F., 2019. Cash or Card? Unravelling the Role of Socio-Psychological Factors. *De Economist*, 167(2), pp.145-175.
- Bagnall, J., Bounie, D., Huynh, K., Kosse, A., Schmidt, T., Schuh, S. and Stix, H., 2014. Consumer Cash Usage: A Cross-Country Comparison with Payment Diary Survey Data. *SSRN Electronic Journal*,.
- Khan, J., Belk, R. and Craig-Lees, M., 2015. Measuring consumer perceptions of payment mode. *Journal of Economic Psychology*, 47, pp.34-49.
- Schreft, S., 2006. How and Why Do Consumers Choose Their Payment Methods?. SSRN Electronic Journal,.
- Dahlberg, T. and Oorni, A., 2007. Understanding Changes in Consumer Payment Habits Do Mobile Payments and Electronic Invoices Attract Consumers?. 2007 40th Annual Hawaii International Conference on System Sciences (HICSS'07),.
- Crowe, M., Schuh, S. and Stavins, J., 2006. Consumer Behavior and Payment Choice: a Conference Summary. *SSRN Electronic Journal*,.
- Jonker, N., Cruijsen, C., Bijlsma, M., and Bolt, W., 2020. Pandemic payment patterns. DNB Working Papers 701, Netherlands Central Bank, Research Department.
- Khan, J. (2011). Cash or card: consumer perceptions of payment modes. PhD thesis, Auckland University of Technology, Auckland.



## ฝ่ายนโยบายระบบการชำระเงิน

273 ถนนสามเสน แขวงวัดสามพระยา เขตพระนคร กรุงเทพฯ 10200 โทรศัพท์ 0-2283-5353

## สายออกบัตรธนาคาร

18 ม.2 ถ.บรมราชชนนี ต.ขุนแก้ว อ.นครชัยศรี จ.นครปฐม 73120 โทรศัพท์ 0-2356-8687

# สถาบันวิจัยเศรษฐกิจป๋วย อึ๊งภากรณ์

273 ถนนสามเสน แขวงวัดสามพระยา เขตพระนคร กรุงเทพฯ 10200 โทรศัพท์ 0-2283-6066