Cashless Economy: The Behavior of Using E-payment in Thailand

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Abstract

This research article aims to study the behavior of using e-payment in Thailand, examining the financial factors of: 1) stepping into Thailand's cashless society, 2) people's perceptions of a cashless society, and 3) financial forecasting. In the research, Part 1 results indicate that Thailand is experiencing a growing behavior of using e-payment due to the continuous growth of payment channels through various payment systems and channels. According to the period from 2010 to 2021, a significant leap forward in this regard has been witnessed. Thus, Thailand is likely to transition from a cash-based society to a cashless society. This situation agrees with research by Thomas et al. [1]. In the current research, Part 2 results describe a study of 2,800 respondents from 2015 to 2019 and the effects of this behavior of using e-payments. Exchange and payment all come from consumer decision-making behavior. Since financial technology, or Fintech, is now part of the direction of the development of a cashless society in Thailand, the adoption and use of technology is, therefore, an important factor. The important internal factors include Performance Expectancy, Effort Expectancy, Social Influence, etc., which are consistent with and related to the behavior of using e-payment. From this research, it was concluded that the factors related to the transformation towards the behavior of e-payment in Thailand are the following: 1) personal factors, i.e. gender, age; 2) factors affecting decision-making; 3) factors of acceptance and use; and 4) technology adoption, all of which are factors that correlate with e-payment behavior.

Keywords: Cashless Society, Cashless Economy, The Cashless Economy Behavior of Using e-payment.

Introduction

When it comes to the features of money, Ingham [2] mentions money (Money) in the book *The Nature of Money,* and highlights the emergence of social technology, in writing and numbers, over a long period. Ingham explores the question: Which one is the basis for a large society in this world, from the past to the present? In addition, Carruthers and Ariovich [3] explain the meaning of money as being generalizing, legitimate, and based on value, with the following definitions: 1)Money has value, which people can use for accessing products and services, whereby money is a form of power.2)Money gives the legitimate possibility to buy goods and services. And, 3) money (Money) is universal (Generalize). in addition, Smith [4] had his ideas about money. In the late 18th century, money was considered the Great wheel of circulation (Smith, 1976, p. 309) [4] and the fundamental objective of market exchange. in addition, Weber [5] explained how, during the 20th century, gold was the international standard that most people embraced. In addition, money also encourages the participation of people in the form of paying taxes (Tax), which the government uses to create a budget. [6]

As well, Davies [7], in the book *History of Money*, describes the function of money (Money). The specific function (mostly microeconomic) consists of: (1) A unit of account (abstract). (2)The basic measure of value (abstract). (3)An exchange (a medium of exchange (concrete)). (4) A method of payment (a means of payment (concrete)). (5) A standard for payment (a standard for a deferred payment (abstract)). (6) Value collection (A store of value (concrete)).

The model of a cashless economy is a concept of leading economists that first emerged in the commercial banking sector in the 1950s. With the expansion of this concept leading to the development of so-called electronic commerce, or e-commerce, Economides [8] mentioned its continued growth. Due to the development of efficient financial instruments, Odlyzko [9] studied the key factors that have contributed to the success of countries leading the way into the era of a cashless society, which can be summarized with 3 factors: 1) Legal Factors; 2) Technology Factors, and 3) Social Factors. A Technology Acceptance Model (TAM) and theory [10] was modified and applied from the theory of reasoned action, which is related to the understanding and forecasting of human behavior [11]; Davis (1989).[10] External Variable means the influence of external variables which create a different awareness for each person, such as beliefs, experiences, knowledge, understanding of social behavior, etc.

For Thailand, the move towards a cashless society is currently supported in many aspects, such as the support for legal factors, to be more conducive to the operation of technology factors, which are constantly evolving in the banking business and financial business groups, and social factors, which play an important role in driving the country to a cashless society in which people accept and have trust in their current financial system. This will result in development and advancement towards set goals. The government and the Ministry of Finance have given this importance and support by assigning the Bank of Thailand to prepare a development strategy plan to drive the country further towards bringing the country to a cashless society, as well as developing the Central Bank Digital Currency (CBDC) of the Bank of Thailand. This concept was first developed in 2008 and is currently being tested in the private sector to become the financial infrastructure of Thailand.

Research objectives

1. To study the financial factors of stepping into Thailand's cashless society.
2. To study people's perceptions of a cashless society.
3. To study financial forecasting factors.

Research method

Population and sample

The researcher determined the methods and equipment used in this research, which consists of the sample group and the population, the tools used and data collection, and

the statistics for data analysis. Using data from these 2 parts together, the details are as follows.

1. Collection of information on payment methods through the financial system from 2010 to 2021 from the Bank of Thailand.

2. Data collection consists of:

2.1. Data collection of relevant literature, articles and research, both locally and internationally, to summarize the linkage of the data to this research study.

2.2. Collection of data from the population and samples, consisting of a total of 2,800 samples. The method for submitting the instrument, or questionnaire, used simple random sampling through the transmission of the instrument or questionnaire by postal mail and information systems. The Survey Monkey program was used to help collect data from the official online system using tool delivery channels through social media until the required amount was reached.

Research tools

The research instruments used included Time Series data, payment channels of the Bank of Thailand from 2010 to 2021, and data collection. From the questionnaire, we studied the factors affecting a moneyless society in Thailand.

Data collection

In the data collection, the researcher distributed and collected 3,200 questionnaires, divided into documents and online questionnaires. We thereby collected back 2,850 copies, and analyzed 2,800 copies, or 100 percent. After obtaining the data, the data was then examined for accuracy to ensure accurate data for further analysis.

Data analysis

For data analysis, the researcher used the data from Part 1, Time Series data, payment channels from the Bank of Thailand, and the study's Part 2 data from the research population. Samples were analyzed using descriptive and explanatory methods from the statistical data.

Research results

Based on the conceptual framework of Thomas et al. [1], we measured progress toward a cashless society, which describes the effectiveness of electronic payment mechanisms using provisions of the proportion of cash payments and consumer electronic payments. These include:

1. Share of cashless payment: which refers to payments made by electronic financial systems, with the creation of an infrastructure system to support it in the form of the financial system. This has a significant positive effect on promoting the cashless financial system.

2. Trajectory of cashless payment: Trajectory measures show how the share of consumers who pay electronically has grown over time.

3. Readiness for cashless payment: The importance of the relationship component between cash and consumers provides a level of measurement for the conditions that could result in exiting the use of cash.

Part 1: Time Series information, and payment methods from the Bank of Thailand.

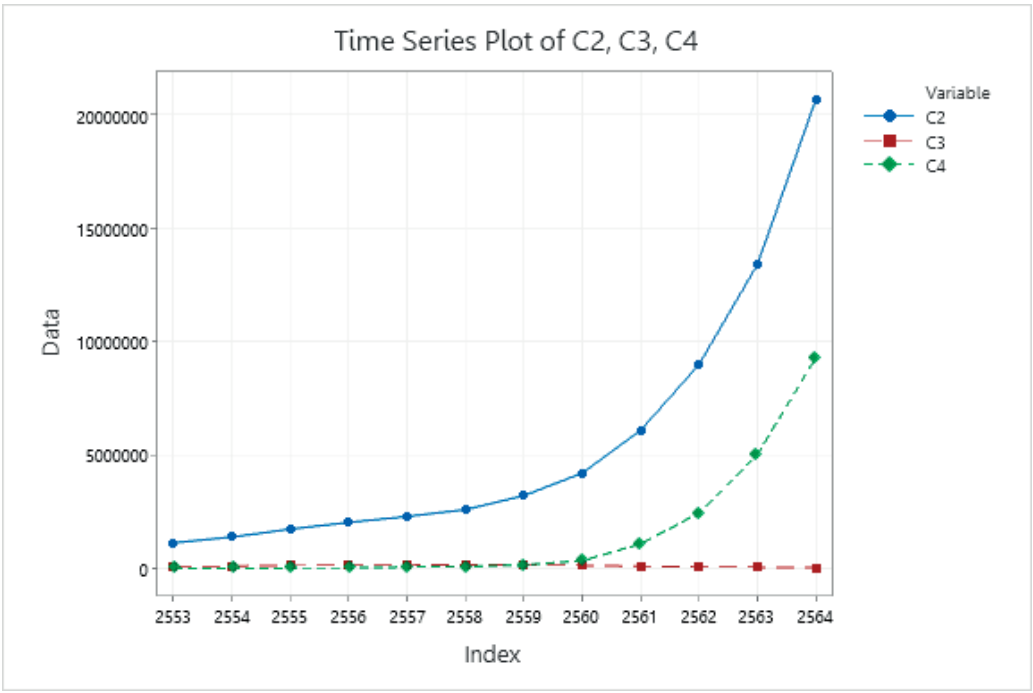

Figure 1. The number of payments made through Electronic payments (e-payments), cross-bank micro-transfers via ATMs, and interbank micro-transfers via the Internet and mobile phones from 2010 to 2021.

Source: Bank of Thailand (Unit: million Baht) calculated by the researcher

when: C2 represents electronic payments (e-payments), C3 instead of interbank micro-transfers via ATMs, C4 instead of interbank micro-transfers via the Internet and mobile phones.

Looking at Figure 1, the volume of payments made through different payment systems and channels over the period from 2010 to 2021 shows that the volume of electronic payments (e-Payments) (C2) ($\overline{x}$=5,638,793) increased steadily, especially from 2017 to 2021, with a significant leap forward in volume. When considering cross-bank retail money transfers via the Internet and mobile phones (C4) ($\overline{x}$=1,540,942), it was found that volume increased with a similar graph slope to electronic payments (e-Payments) (C2) ($\overline{x}$=5,638,793), and when considering cross-bank

micro-transfers via ATMs (C3) ($\overline{x}$=102,076), the slope of the graph exhibits a small yet constant change in the slope of the graph. This indicates that the growth of channel cross-bank micro-transfers via ATMs (C3) ($\overline{x}$=102,076) had no past growth or recessive growth rates.

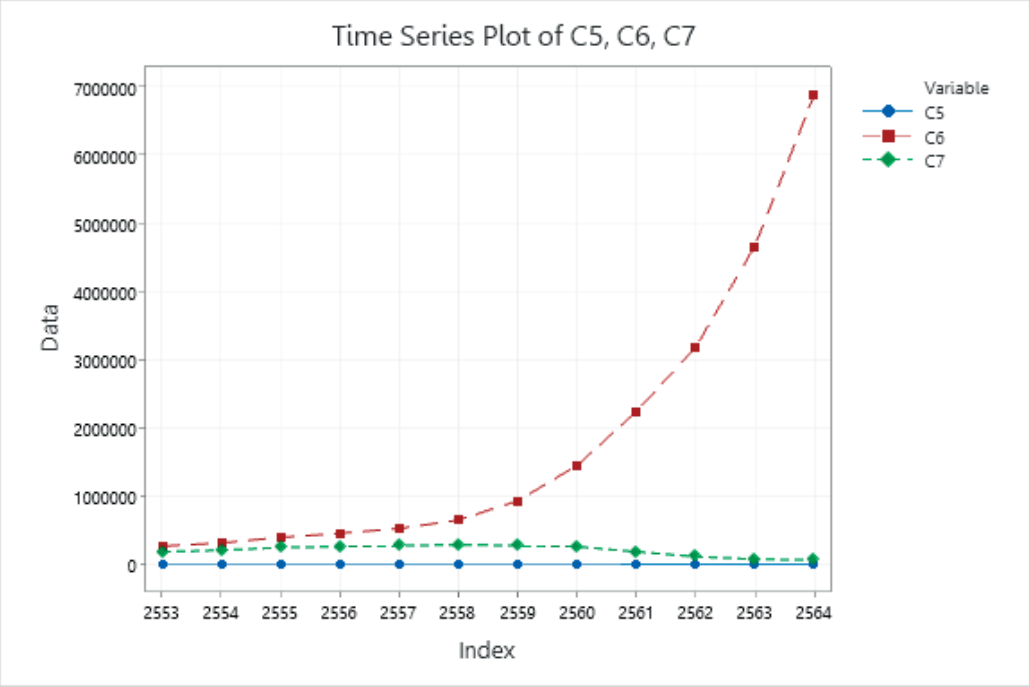

Figure 2. The number of payments through the retail money transfer system across banks through branches via intra-bank transfers (including payment for goods and services) and money transfer/payments via ATMs from 2010 to 2021.

Source: Bank of Thailand (Unit: Million Baht) calculated by the researcher

when: C5 instead of interbank micro-transfers through branches, C6 instead of internal bank transfers (includes payment for goods and services), C7 instead of money transfers/ payments via ATM.

When considering Figure 2, it was found that internal bank transfers (including payment for goods and services) (C6) ($\overline{x}$=1,826,160) showed an increase in volume, especially from 2017 to 2021, with a steep slope. This represents a leap forward. On the other hand, regarding cross-bank micro transfers (c5) ($\overline{x}$=7867.25) and ATM transfers/payments (c7) ($\overline{x}$=198,387), the slope of the graph is in a regression change.

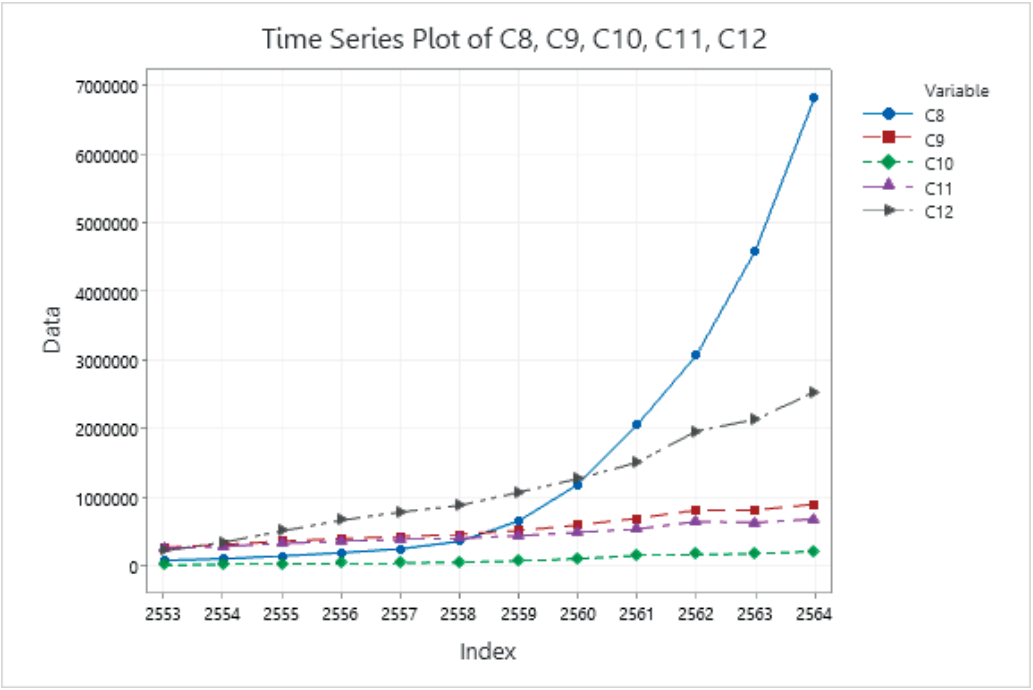

Figure 3. Payments through the Money transfer/payment system via internet and mobile phone Payments were made by plastic cards (payment cards), debit cards, credit cards, and e-Money from 2010 to 2021.

Source: Bank of Thailand (Unit: million Baht) calculated by the researcher

when: C8 instead of money transfer/payment via internet and mobile phone, C9 instead of plastic card payment (payment cards), C10 instead of debit cards, C11 instead of credit cards, C12 represents electronic money (e-money).

Looking at Figure 3, it was found that money transfers/payments via the internet and mobile phones (C8) ($\overline{x}$=1,627,774) had a high level of graph slope. Demonstrating growth in such channels during the years 2017 to 2021 indicates a leap in growth. Also, in the electronic money (e-Money) channel (C12) ($\overline{x}$=1,160,109), continuous growth, as shown in the graph in Figure 3, is seen.

In the channels for payment cards (C9), debit cards (C10) ($\overline{x}$=92,826.9) and credit cards (C11) ($\overline{x}$=456,557) in Figure 3, modest growth from 2010 to 2021 is seen, so there has been modest growth in the past 12 years.

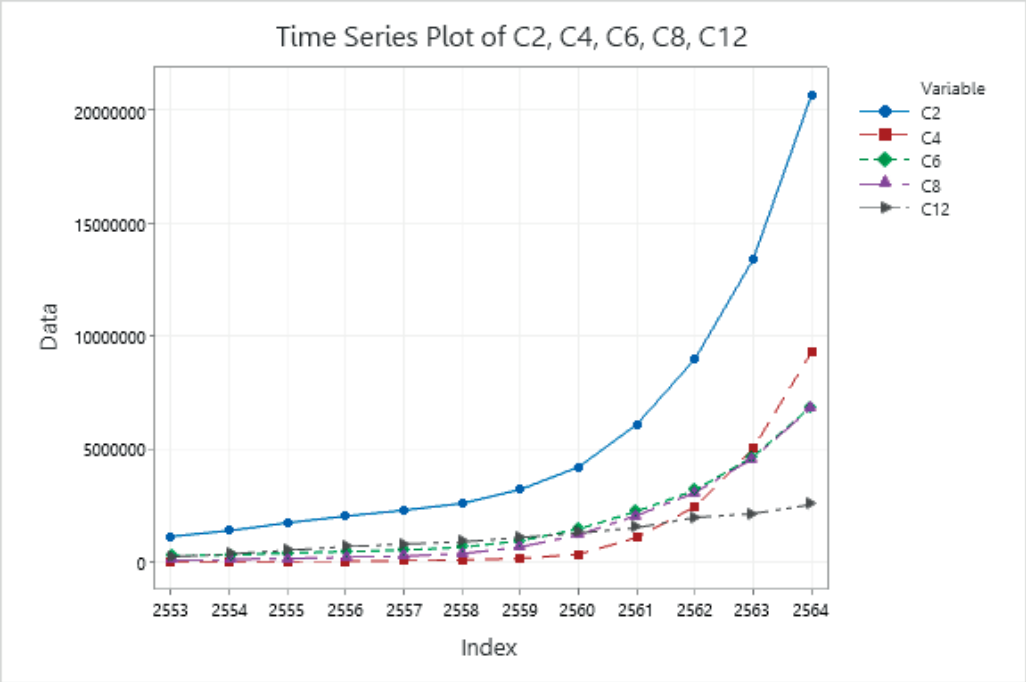

Figure 4. The volume of payments through various payment systems and channels has continued to grow from 2010 to 2021.

Source: Bank of Thailand (Unit: million Baht) calculated by the researcher.

The volume of payments through various payment systems and channels is constantly growing. According to the period from 2010 to 2021, ranked in order of growth rate, we found that the channels that have seen growth over the past 12 years can be categorized as follows:

1. Electronic payments (e-Payments) (C2).

2. Retail money transfers across banks via the Internet and mobile phones (C4).

3. Internal bank transfers (including payment for goods and services) (C6), and money transfers/payments via the Internet and mobile phones (C8).

4. Electronic Money (e-Money) (C12).

This trend clearly shows the changing behavior of people. This shows a significant change in the pattern of using cash that has continued to decline in a recessive manner. There has also been continuous growth in payment channels in the online form, indicating a significant leap forward there.

When the data were analyzed for trends, it was found that

electronic payments (e-Payments) (C2) show a growing trend that can be written as a forecast equation as follows:

$Yt_2 = 0.000000 + 1.00000 \times t$

when: Yt_2 represents electronic payments (e-Payments) (C2)

t represents the number of years.

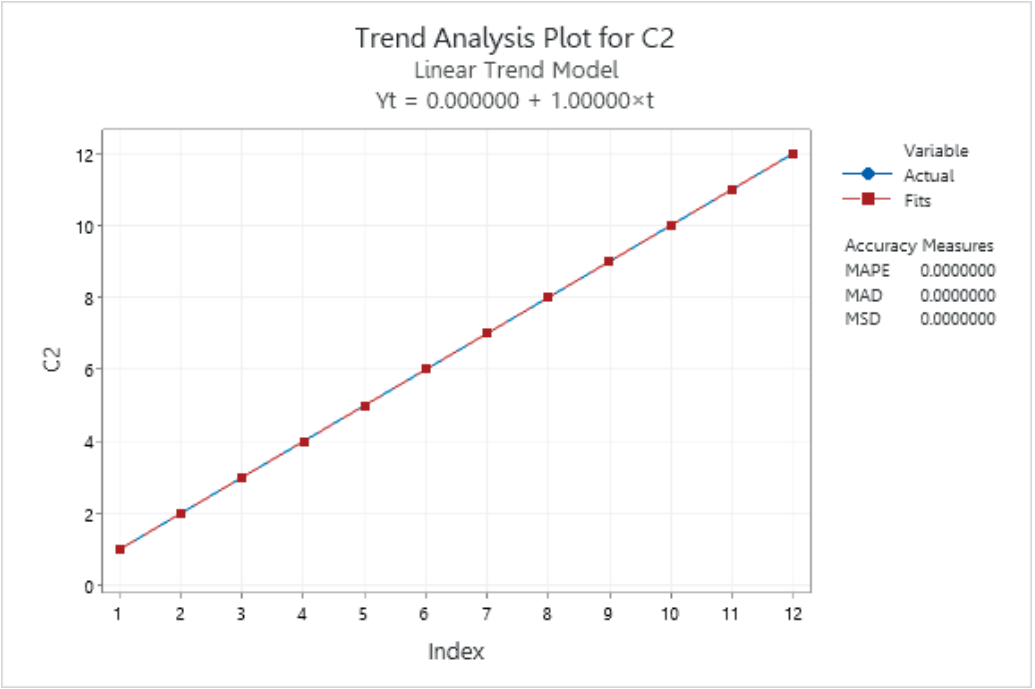

Figure 5. Graph showing the trend forecasting equation of electronic payments (e-Payments) (C2) from 2010 to 2021

Cross-bank retail money transfers via the Internet and mobile phones (C4) have a continuous growth trend which can be written as an equation for forecasting as follows:

$Yt_4 = -2321694 + 594252 \times t$

when: Yt_4 instead of interbank micro-transfers via Internet and mobile (C4), t represents the number of years.

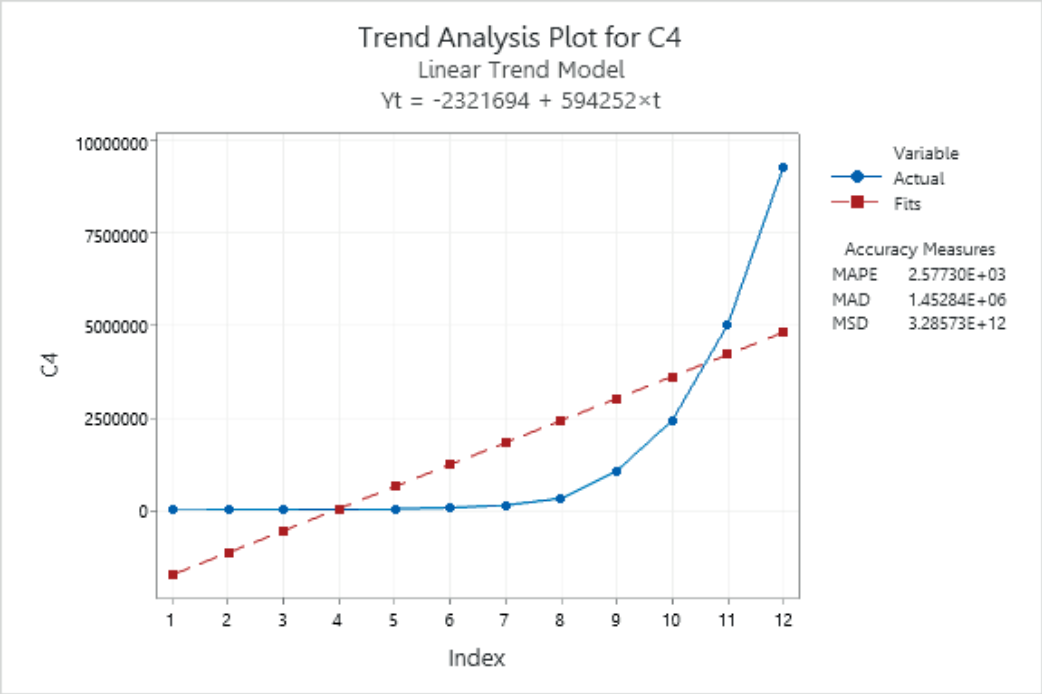

Figure 6. Graph showing the trend forecasting equation of cross-bank retail transfers via the Internet and mobile phones (C4) from 2010 to 2021

Intra-bank transfers (including payment for goods and services) (C6). The trend of continuous growth can be written as an equation for forecasting, as follows:

$$Yt_6 = -1433548 + 501494 \times t$$

when: Yt_6 instead of internal bank transfers (including payment for goods and services)(C6), t represents the number of years.

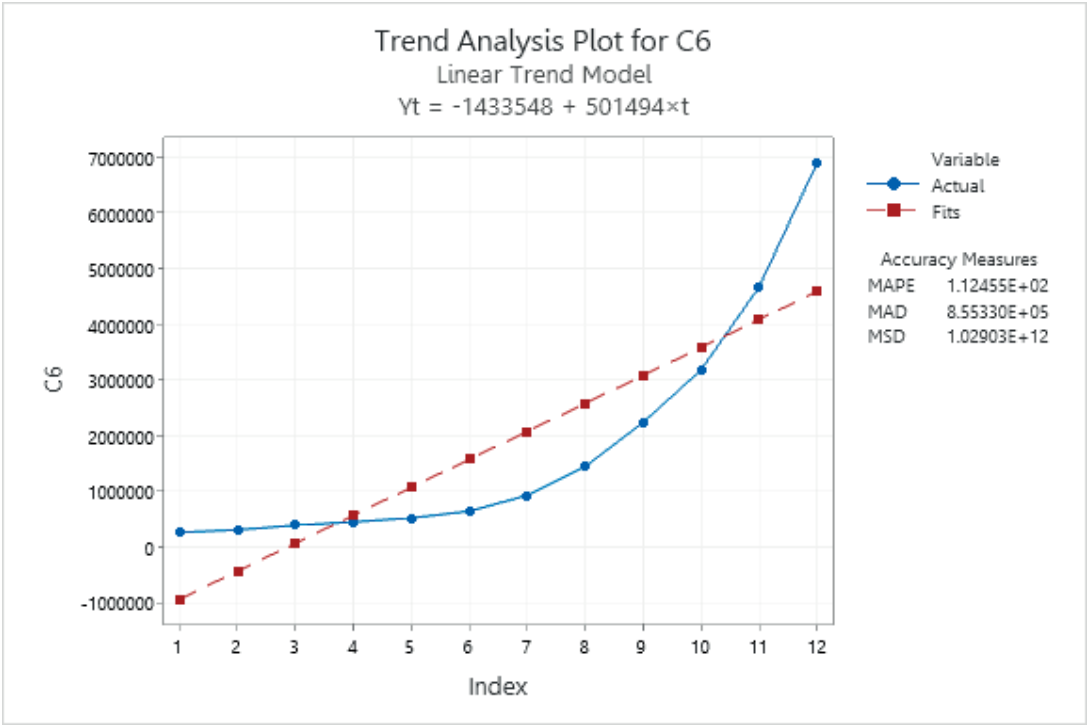

Figure 7. Graph showing the trend forecasting equation of intra-bank transfers (including payment for goods and services) (C6) from 2010 to 2021

Money transfers/payments via the Internet and mobile phones (C8). The trend of continuous growth can be written as an equation for forecasting as follows:

$Yt_8 = -1720133 + 515063 \times t$

when: Yt_8 instead of money transfer/payments via Internet and mobile phones.

t represents the number of years.

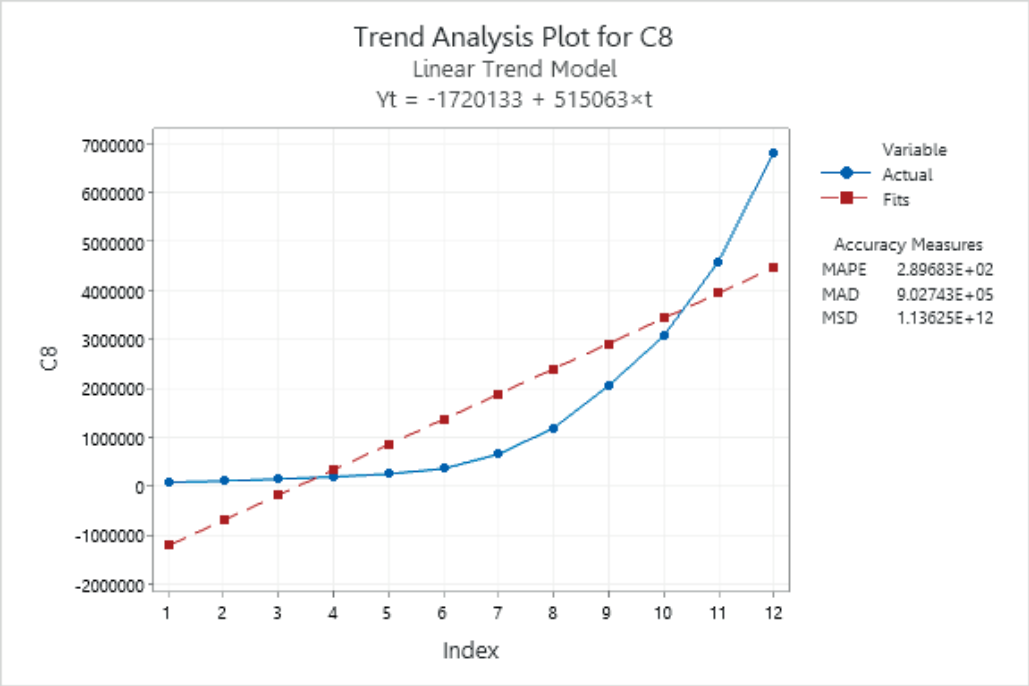

Figure 8. A graph showing the trend forecasting equation of money transfers, payments via the Internet, and mobile phones (C8)

Electronic money (e-Money) (C12) continuous growth trend, which can be written as an equation for forecasting as follows:

$$Yt_8 = -1720133 + 515063 \times t$$

when: Yt_8 instead of money transfers/payments via the Internet and mobile phones. t represents the number of years.

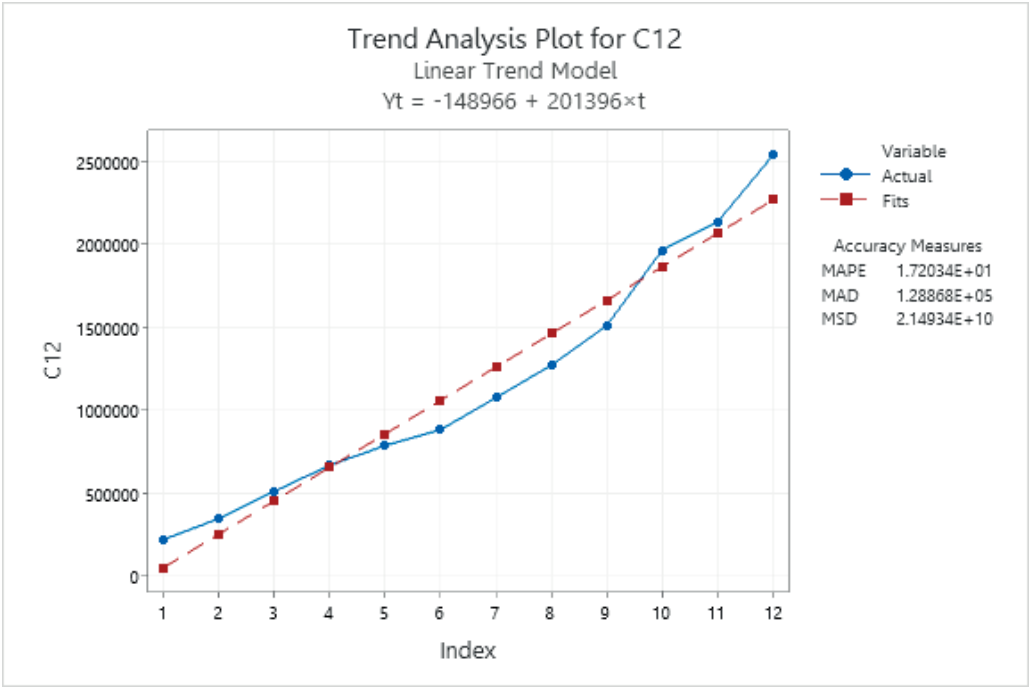

Figure 9. Graph showing the trend forecasting equation of Electronic Money (e-Money) (C12)

Part 2

A study of 2,800 respondents from 2015 to 2019 was analyzed using descriptive statistics to describe the characteristics of personal factor data, as well as factors that can explain the changes in Thai society leading to the entering of a cashless society era, details are as follows.

Most of the respondents surveyed were males, totaling 1,623 samples, representing 55.50%, with the highest age range being 36-40 years of age, and 1,139 representing 31.30%. Occupations of the respondents were mostly employees of companies, with 331 samples, representing 31.40 percent, with an average service life of 8.95 years. For educational level, it was found that most respondents had graduated with a Bachelor's degree, at 462 samples, representing 43.78%. As for income, it was found that the income of most respondents was in the range of 15,001–20,000 baht, totalling 722 samples, representing 28.81%. Most of the respondents lived in urban areas or municipalities, from 890 samples, or 84.44%.

From the research, it was found that factors affecting the decision of the sample group's attitude towards the relationship between opinions and factors influencing their decision making behavior of using e-payment, indicated a positive correlation regarding their opinions on the behavior of using e-payment. The statistical significance was at the .05 level. Factors affecting decision-making ($\overline{X}$== 4.13, SD=.733) were related to e-payment usage

behavior due to conditions related to e-payment. Each aspect associated with e-payment behavior, such as physical conditions, psychological factors, family, social and cultural conditions ($\overline{X}$=4.20, S.D.=.777), all affected their decision-making. This affects the behavior of using e-payments, and is in line with Odior and Banuso [12], who discuss diverse financial patterns in economic activities, which has an accounting unit store of value. Exchange and payment all come from consumer decision-making behavior.

Regarding the factors for adoption and use of technology, the sample group had an attitude towards the acceptance factor and the use of technology. By determining the relationship between opinions on factors of acceptance and use of technology, and opinions on the behavior of using e-payment, we found that the results from the evaluation of the relationship between opinions on acceptance and use of technology showed that opinions on the behavior of using e-payment were positively correlated at a high level ($\overline{X}$ = 4.17, S.D.=.809), with statistical significance at the .05 level. Since financial technology, or Fintech, is now part of the direction of the development of a cashless society in Thailand, the adoption and use of technology is, therefore, an important factor. The important internal factors are Performance Expectancy, Effort Expectancy, Social Influence, etc., which are consistent with and related to the behavior of using e-payment.

From this research, it is concluded that the factors related to the transformation of the behavior of e-payment in Thailand are as follows: 1) personal factors, i.e. gender, age; 2) factors affecting decision-making; 3) factors of acceptance and use; and 4) technology adoption, which are all factors that correlate with e-payment behavior, and which is consistent with Feige [13], who discusses the financial innovations that will lead to widespread forecasting of a cashless society; and Bátiz-Lazo, Karlsson, & Thodenius [14], and Khan & Craig-Lees [15]. KUMARI and Khanna [16] who discussed the research of D. Garcia-Swartz, Hahn, & Layne-Farrar [17], to suggest the use of cashless payment systems, such as electronic payment through a computer network instead of cash.

Discussion of the results

Issue 1: From the research results, it was found that Thailand has a growing behavior of using e-payment, due to the continuous growth of payment channels through various payment systems and channels. According to the period from 2010 to 2021, a significant leap forward in this regard has been witnessed, suggesting that Thailand is likely to transition from a cash-based society to a cashless society. This situation agrees with research by Thomas et al. [1], who examined this transition from the behavior of using e-payment to the efficiencies of electronic payment mechanisms.By considering the ratio between consumers' cash and

non-cash payments, changes in this ratio have taken a jump in the last 5 years. In addition, Ten Raa and Shestalova [18] conducted a study of Dutch retailers' trading data and found a reduction in transaction costs based on trading volumes for cash and debit cards at the company level. By looking at the options for payment between fixed and variable costs, they found that cash has low fixed costs, but the variable costs are high. Therefore, the efficient way to use cash is to use it for small payments. On the other hand, electronic payment tools have high fixed costs, but the variable costs are low. Therefore, electronic payment tools will be most effective for large payments. In addition, a Brits and Winder [19] study examined the cost of POS payments in the Netherlands. Their survey assessed the social costs of using cash payment tools such as e-wallets, debit cards, and credit cards. The conclusion of the study says that, first of all, payment costs are regulated by the banking industry and central banks. Secondly, central banks, commercial banks, and entrepreneurs contributed to this study. Thirdly, the survey differentiates between fixed and variable costs. Variable costs also differ in terms of costs for different amounts of transactions, and the costs depend on the size of those transactions. Bergman et al. [20] examined the cost estimates of different types of payment instruments in Sweden by using basic information from the year 2002, as calculated from the private and social costs of using cash, debit cards, and credit cards to pay for goods and services. It considered the cost relationship of the customers. Considering the size of the payment, it was found that cash is more costly (0.52 euros) than using a debit card (0.50 euros). In addition, credit and debit cards were the most powerful tools, which was consistent with the research results.

Issue 2: The second point summarizes the important factors in promoting Thailand's development toward a cashless society. They consist of (1.) Acceptance of the reliability of the payment system. (2.) Security and anonymity. At present the security of the system is low. (3.) Technology in the operation of the system. This is consistent with the findings of Baddeley [21], and Khan and Craig-Lees [15], *Factors Influencing Decision Making*. Adul Chaturongkul [22] also conducted a study on consumer behavior and found that making small decisions is a process undertaken before considering the purchasing decision. He also found that technology acceptance was a key factor in the transition from a cash-based economy to a cashless-based economy. Davis [10] studied the successful acceptance of the technology and developed a theory of action termed the Theory of Reasoned Action (TRA). TAM theory can also be used to study factors that influence the effective adoption of innovation and technology. [10]

Conclusions/Recommendations

This study found problems related to system security in the form of cybercrime. This is consistent with Akinola [23], who refers to the crimes that can follow, as well as the violation of privacy rights [24], which Nontakorn Tedthaveedech [25] mentioned. The first disadvantage of this concept is the loss of privacy in financial transactions. This is due to the ability to access the personal data of banks, operators, and governments. Another major disadvantage is excessive fussiness because convenience will tempt people to spend more. Therefore, the public and private sectors should be encouraged to maintain knowledge development, as well as build credibility in the technology applied to payment channels for goods and services, as well as in the government sector. It should promote and create conditions that are conducive to technology development to make decisions about the use of payment channels for goods and services. In addition, from the results of the experiment, it was found that cash is unsuitable for today's society due to the epidemic situation of Covid-19, and when used in large quantities, it is difficult to carry around. Variously, there must be a need to keep a lot of cash on hand, and developments in the financial system in the past, both in technology and in the behavior of consumers using e-payment, have resulted in an efficient and modern payment system with an e-commerce system that makes products and services very convenient. More and more, this directly affects consumer behavior. In addition the government sector, the Bank of Thailand, and the Ministry of Finance have supported, promoted, and made access to financial technology more convenient, such as the Thailand 4.0 policy, and the Central Bank Digital Currency (CBDC) policy. As well, this encourages financial transactions through Fintech systems that are more reliable and accurate. This creates Big data, which helps to analyze data and further promote Thailand's future financial policy. Finally, the behavior of using e-payment is higher in all aspects, causing the promotion of foreign investment by converting Big data into a clear economic policy. This will lead to a smooth transition from a cash society to a cashless society in Thailand.

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