

**A CASE STUDY TAIWANESE'S PERCEPTION ON  
ELECTRONIC PAYMENTS**

By

**JING-ZOU CHEN**

陳靜柔

Submitted to the Faculty of  
Department of International Affairs in partial fulfillment  
of the requirements for the degree of  
Bachelor of Arts in International Affairs

Wenzao Ursuline University of Languages

2020

WENZAO URSULINE UNIVERSITY OF LANGUAGES  
DEPARTMENT OF INTERNATIONAL AFFAIRS

This senior paper was presented

by

Jing-Zou Chen  
陳靜柔

It was defended on

November 30, 2019

and approved by

Reviewer1: Yuan-Ming Chiao, Associate Professor, Department of International  
Affairs

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Reviewer2: Mark Lai, Assistant Professor, Department of International Affairs

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Advisor: YuJane Chen, Associate Professor, Department of International Affairs

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Copyright © by Jing-Zou Chen 陳靜柔

2020

# **A CASE STUDY OF TAIWANESE'S PERCEPTION ON ELECTRONIC PAYMENTS**

Jing-Zou Chen 陳靜柔, B.A.

Wenzao Ursuline University of Languages, 2020

## **Abstract**

The research objective is to explore Taiwanese's cognitive on electronic payments. In the era of the high development of technology, one does not need to go out with wallet to buy stuffs. One only needs to use finger or fingerprint verification on the phone to pay money in a pretty easy way. Nevertheless, there are not many people using electronic payments currently. Why? Do many people know how to use electronic payments? With the above questions, this research took three research questions to explore Taiwanese's cognition on electronic payment, including their cognition, privacy risk, trustworthiness.

This research conducted through quantitative research method. It applied internet questionnaire to collect 177 first-hand data from respondents. This research had found out Taiwanese' cognition on electronic payment and how such cognition had affected the usage of electronic payments. Within the analysis, this research has also explored the opinions of respondents. It is expected that the finding factors would be able to improve the user's perception on electronic payment and use electronic payment in the future with comfortable mind.

Keywords: electronic payment, cashless society, mobile payment, digital currency

## TABLE OF CONTENTS

INTRODUCTION.....	1
Background .....	1
Research Purpose.....	4
Research Questions.....	4
Contribution .....	4
Limits .....	5
Delimits.....	5
LITERATURE REVIEW .....	6
The Definition of Electronic Payments .....	6
The Definition of Privacy Risk .....	10
The Definition of Trustworthiness.....	12
METHODOLOGY .....	15
Questionnaire Design.....	15
Data Collection and Analysis .....	16
DATA ANALYSIS.....	17
Reliability Test.....	17
Descriptive Analysis .....	18
Independent Sample T-test .....	21
One-way Analysis (ANOVA).....	23
Multiple Linear Regression.....	27
CONCLUSION .....	29
APPENDIX.....	31
BIBLIOGRAPHY .....	34

## LIST OF TABLES

Table 1. Cronbach's $\alpha$ of reliability .....	18
Table 2. Reliability analysis .....	18
Table 3. Comparison of differences in privacy risk, trustworthiness, ease of use and use motivation between different genders. ....	21
Table 4. Comparison of differences in privacy risk, trustworthiness, ease of use and use motivation between different answers of whether use electronic payments.....	22
Table 5. Four different ages on perceptions of privacy risk.....	23
Table 6. Four different ages on perceptions of trustworthiness.....	24
Table 7. Four different ages on perceptions of ease of use .....	25
Table 8. Four different ages on perceptions of use motivation .....	26
Table 9. Pearson Correlation Analysis .....	27
Table 10. Linear Regression Analysis .....	27
Table 11. Linear Regression Analysis .....	28

## LIST OF FIGURES

Figure 1. Flow of money in cash payment system .....	8
Figure 2. Flow of money in bank-card payment system.....	9
Figure 3. Distribution of gender .....	19
Figure 4. Distribution of age .....	19
Figure 5. Distribution of monthly income.....	20
Figure 6. Distribution of whether respondents use electronic payment.....	20

# INTRODUCTION

## Background

In the early era, human traded in a bartering manner. Later, it developed into using shells as currency, and finally entered into using commodity currency, which are the fiat paper currency and coins. Experts have constantly predicted that cash will be used in a limited way and the world will become a cashless society. Nowadays, many of us are still paying by cash or checks for buying stuffs. However, it is certain that payment by plastic cards are much faster than by paper currency and coins. Furthermore, due to the advanced development of technology and the Internet, there are many kinds of ways that one can choose to pay for shopping. One only needs a card or a mobile phone to purchase items anywhere.

Electronic payment system is a way of trading or paying for items through electronic media, without the need for checks or cash. Nowadays, more and more people use electronic payments, and many our friends have also used electronic payments. They can be used to buy goods, information or services at physical retail stores or on online shops. Therefore, variety types electronic payment systems have been stimulating to cater the needs of e-commerce.

Electronic payment systems can be divided into four categories: credit cards, debit cards, electronic cash and micropayment systems.<sup>1</sup> The most popular ones are credit cards and debit cards. According to UK Finance report in 2018, only thirty-four per-cent of payments were made in cash in the UK. Debit cards exceeded cash as the most popular payment method for the first time in 2017.<sup>2</sup> In addition, there are other

---

<sup>1</sup> "Electronic Payment Systems - Computer Definition," 2010, <https://www.yourdictionary.com/electronic-payment-systems>.

<sup>2</sup> "What a Cashless Society Could Mean for the Future," 2018,



ways to pay, such as bank transfers, e-wallets, smart cards or bitcoin wallets.

The mechanism of paying by electronic payment to transfer the banking information to perform a payment or transfer funds through the Internet between consumers, businesses and financial institutions. The method of electronic payment can be divided into two categories: credit payment systems and cash payment systems.<sup>3</sup> Under the credit payment systems, there are credit cards, e-wallets, and smart cards. Under the cash payment system, there are direct debit, electronic check, electronic cash, and stored-value card. In addition, there is mobile payment. One only needs to deposit credit card into mobile phone, and one can go out without bring real cards or money.

Mobile payments, as the name implies, are measures of payment that both sides of seller and buyers in a transaction paying and receiving money through mobile devices, normally mobile phones. In other words, in the past, consumers had to pay cash at the counter when they checked out the bills. Now they can use mobile phones and NFC (Near Field Communication) to pay bills. Therefore, one can only bring one's cell phone to go anywhere without carrying cash. Nowadays, the main international mobile payments are. For example, Apple Pay, Samsung Pay, and Google Pay. Among them, Apple Pay is used by most people.

According to the statistics released by the Financial Supervisory Commission, there were sixteen service providers had serviced coded mobile credit cards. The figure of combining credits with the three major payments had as high as 3.64 million and the transaction sum was 17.56 billion. Furthermore, as the end of April 2018,

---

<https://www.forbes.com/sites/vishalmarria/2018/12/21/what-a-cashless-society-could-mean-for-the-future/#43627ee23263>.

<sup>3</sup> Sandra Wróbel-Konior, "What Is an E-Payment System?," 2018, <https://securionpay.com/blog/e-payment-system/>.

comparing with 1.08 million and 830 million in the same period last year.<sup>4</sup> It was clearly indicated that the number grew up a lot.

More and more new electronic payments are launched. Some of them pay money by the Internet; this many possibility brings big risk to users. Because of the developed Internet, your own personal information can be easily stolen by the identity thieves. As a result, many people still prefer to use credit cards and cash cards.

However, can everyone accept and be good at using electronic payments? Can the purpose of paying achieved without time or geographical factors?

This research is carried out as follows. There were five parts in this research. First one is introduction. It describes the research background, motivation, purpose, questions, limits and delimits. The second part is literature review. It included the basic concept of electronic payments, and literature from some academics. Third, methodology. Fourth, data analysis, and the last part is conclusion and suggestion.

### **Motivation**

Due to the speedily advanced of Internet, the development of e-commerce, electronic payments had grown explosively in recent years; and they have huge market potential; it can be called an important breakthrough in modern business. They will also affect people's consuming behavior in the future. Furthermore, almost everyone has smartphone nowadays. Although mobile payment has been popular in Taiwan market for three to four years, credit cards and cash seem to be more convenient for people to pay so far. It seems that mobile payment is still not popular as we may aware. Why? What are the factors that cause the situation? Many people

---

<sup>4</sup> "Three Pay Assistance, Mobile Payment Transactions Increase 6 Times," 2018, <http://technews.tw/2018/06/08/big-3-pays-help-tw-mobile-pay-grow-6-times/>.

have argued that the mobile payment will cause privacy risk. Thus, I would like to understand whether these factors have really influenced the consumers' use of electronic payments. Also, this research would find out whether electronic payment provides more convenient or not for most people. It expected to find out the answer in this research.

This paper is to analyze the cognition of electronic payments of Taiwanese people. Moreover, this research would use questionnaire to collect first-hand data to explore the association between electronic payments with these factors. Collected data would also use to check how these factor would affect people's thinking or decision.

### **Research Purpose**

The purpose of the study was to explain whether the cognitions would influence people's decision in the use of electronic payments. This research would only focus on Taiwanese people. By using questionnaire, it expected collected data would be able to answer the three research questions of this research.

### **Research Questions**

1. Why do people not use electronic payments or why do people use electronic payments?
2. What is the relationship between people's perceptions and electronic payments?
3. Will the cognitions influence the use of electronic payments?

### **Contribution**

Although mobile payments have been popular for three or four years in Taiwan, credit cards and cash are still the most used payment means. This research aimed to

know what reasons caused such situation. It might be the three cognitions as having been mentioned above or others. The finding of this research expected to discover the relations associate with the perceptions of people and electronic payments. With the finding of this research, readers of this research might be able to understand more about the cognitions of electronic payments.

### **Limits**

It may be difficult to collect all Taiwanese opinion island-wide, and it is because of the limit of time, this research had only taken population who are the age ranging between sixteen to forty. The author designed to collect the data at least one hundred fifty people because there was only two months to collect data. The author applied online questionnaire to collect first-hand information from people who live in Taiwan; so it is impossible to confirm whether the respondents are in conformity with requirements.

### **Delimits**

Given that the author had only limit time, this research would not be able to collect data all over the Taiwan. Thus, this research had only focused on people who are age raging sixteen to forty. The study would focus on different respondent's perception on electronic payments. After collecting each respondent's cognition, questionnaire had been carefully coding and analyzing by using quantitative research method. In this research, a general perspective among every individual respondents would be explored.

## **LITERATURE REVIEW**

In this chapter, it attempted to find why the cognitions were important for electronic payments. First, the author would like to find when the electronic payments started and how these cognitions were formed and what the definition of them were. The second part would discuss the three perceptions set in this research. Those perceptions were including privacy risk, use cognition, and trustworthiness. Thus, the final part would discuss about some academics' research and take some examples.

### **The Definition of Electronic Payments**

Credit card originated in the United States in 1915. The earliest institutions that issued credit cards were not banks, but some department stores, catering, entertainment and petrol companies. A credit chip was similar to a metal badge was issued to the customer in a certain range, and later it evolved into a card made of plastic as a proof of customer purchase consumption. Customers can rely on the credit chip to purchase goods and installment. With the advancement of technology, in 2007, mobile payments began to appear on the world. In October 2014, Apple pushed out the services of mobile payment and e-wallet. It was the first version of Apple Pay. Samsung Pay and Google Pay were pushed out on the market, respectively, in August and September of 2015.

Goeke and Pousttchi defined mobile payments as a type of transaction methods and it used on the theoretical foundation of mobile money services.<sup>5</sup> It is a technology combined with communication technology and a mobile phone. When one

---

<sup>5</sup> Laura Goeke and Key Pousttchi, "A Scenario-Based Analysis of Mobile Payment Acceptance," (2010 Ninth International Conference on Mobile Business and 2010 Ninth Global Mobility Roundtable (ICMB-GMR)2010).

wants to pay money, one must authorize by password, or alternatively use fingerprints or face identification in most recent technology innovation.

Donner and Tellez had described that “mobile transactions in the developing world enable users, to store the money in an account in your cellphone”.<sup>6</sup> The retailer would act as an agent to cash in and out of bank account and mobile payments. However, consumers do not have a bank account possibly for a variety of reasons. Some reasons are due to the demand for bank history requirements. Other reasons were related to consumers’ preferences, such as privacy requirements. Then there are still other reasons that related to some elements that consumers can control and cannot control. For instance, if the cost of using a bank account is higher than the unstable income; in other words, the cost exceeds the revenue, consumers may choose not to use the bank account. Although there are those reasons that make some consumers do not have bank accounts, the important thing is to figure out the reasons. Why they do not use it? And, what kind of reasons are the main barriers that cause consumers not to use it.

The purpose of knowing those reasons can help those electronic payment providers to set up some useful measures to attract those non-users of electronic payment. Meanwhile, to explore those reasons can also help policymakers to formulate electronic payment policies successfully.

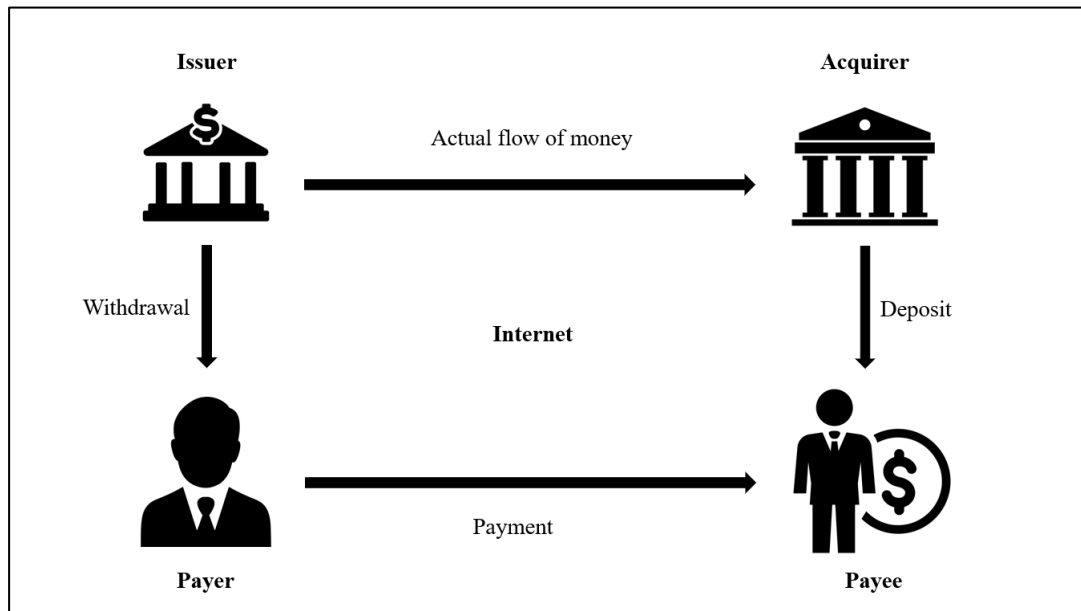
There are two electronic payment systems had been mentioned in the study of Asokan, Janson, Steiner, and Waidner.<sup>7</sup> In their research, there are two figures used to explain the two systems. Figure one, showed the flow of funds in the prepaid, cash payment system. Before purchase, a certain amount of money will be deducted from

---

<sup>6</sup> Jonathan Donner and Camilo Andres Tellez, "Mobile Banking and Economic Development: Linking Adoption, Impact, and Use," *Asian Journal of Communication* (2008).

<sup>7</sup> N. Asokan et al., "The State of the Art in Electronic Payment Systems," *Computer* (1997).

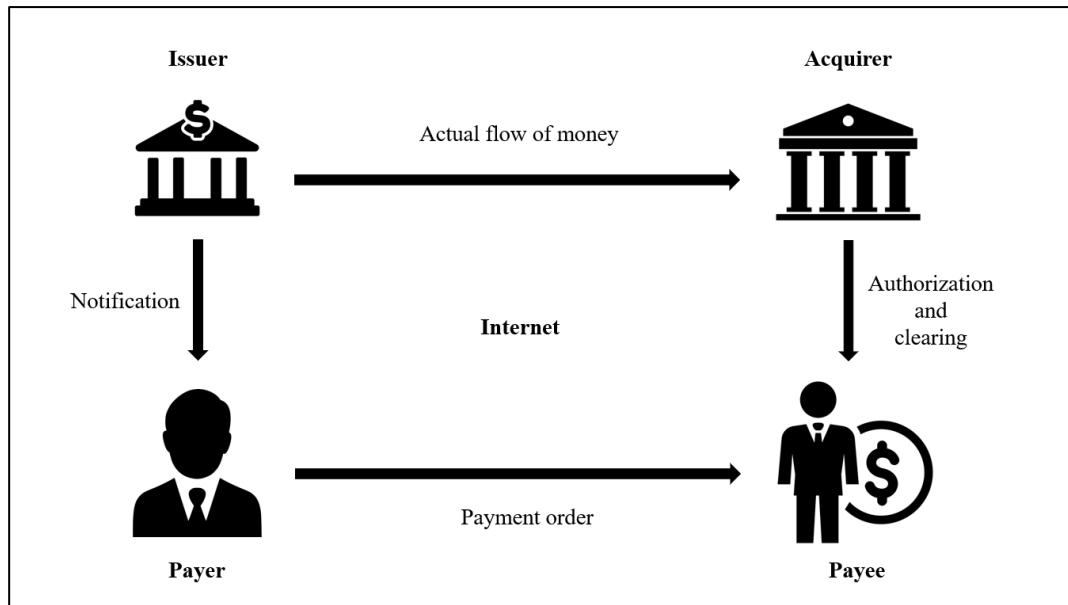
the payer's banking account, and the money can be used for future payments. For example, bank check, electronic cash, electronic smart card are attributed to this type of system.



**Figure 1.** Flow of money in cash payment system

Source: Edited by Asokan, N., Janson, P. A., Steiner, M., and Waidner, M. (1997)

Figure two, showed the flow of money in bank-card system. In this system, it includes pay-now system and pay-later system. For example, Automated teller machine (ATM) cards can be counted as the former type as shown in Figure 1; and credit cards is attributed to Figure 2. In pay-now system, the payer's money is debited from the account at the time of payment. In the post-payment system, the payer entrusts the bank to settle the payment method in the bank account of the payee.



**Figure 2.** Flow of money in bank-card payment system

Source: Edited by Asokan, N., Janson, P. A., Steiner, M., and Waidner, M. (1997)

Both payment systems are direct payment systems. This means that the payer and the payee need to interact in order to operate payment activity. There are also indirect payment systems. In these systems, payment can be performed even if one of the payer or payee is not online. Electronic funds transfer is one of example.

Alison Green had summarized three advantages and three disadvantages of electronic payments.<sup>8</sup> Advantages include: (1) convenience and efficiency: in comparing with traditional payments such as cash and check, electronic payments is easy and convenience. One can pay for service and goods by electronic payment in anytime and anywhere. It can also save the trouble of changing. (2) Sales increasing: the number of people paying in cash is slowly decreasing. Although it is not popular to pay by mobile payment in Taiwan, more than two-thirds of consumers in the US do not carry more than fifty dollars a day. Hence, enterprises can increase sales by using

<sup>8</sup> "Advantages and Disadvantages of E-Payment," 2018, <https://bizfluent.com/info-8188352-advantages-disadvantages-epayment.html>.



electronic payments. (3) Transaction costs: there are usually no handle charge for using a credit card and online payment. In the long term, electronic payments can save hundreds to thousands of dollars in transaction costs for individuals or businesses.

Disadvantages: (1) Security problems: electronic payment now uses encryption and other measures to ensure security; but it is still vulnerable to hackers. For instance, hackers use phishing to attack unsuspecting consumers for detailed information on electronic payments. These security issues normally would cause some people become reluctantly to use electronic payments. (2) Disputed transactions: if someone uses your electronic payment without your authorization, you will claim it from your bank, credit card company or electronic payment company. However, if you do not have enough information about the person who are doing the transaction, it is hard to get compensation. (3) Increased business costs: electronic payment systems require regular installation and maintenance of the system. These technologies must escalate be at an additional cost.

### **The Definition of Privacy Risk**

Traditional payment methods encounter some well-known security problems, such as counterfeiting currency, signatures, identity and so on. It is because these disadvantages and risks that encourage people to use electronic payments. In comparison with traditional banknote, digital payment is much easier to copy perfectly in anytime and anywhere.

With regards to the privacy risk, trust is the most important matter. In academia, there is no recognized definition of trust until now. Many researches included areas such as sociology, marketing, psychology, organizational behavior, economics, and so on into the concern of the privacy risk. Researchers in different disciplines agreed that

trust is important issue for human development and business. However, it seemed that there was a lack of consensus on the proper definition of the concept. Trust was first systematically explored and interpreted by psychologists Mellinger. He defines trust as “the degree to which an individual person believes in the intentions, motivation of behavior, and sincere language of others”.<sup>9</sup> Deutsch mentioned that trust was an individual’s decision-making behavior which would be affected by various situations.<sup>10</sup>

Psychologists regarded trust as a personal characteristic, while social psychologists defined trust as an expectation of others’ behavior in the transaction.<sup>11</sup> Economists had different opinions than psychologists and sociologists by focusing on individuals and groups. On the perspective of economic interests, Bradach and Eccles believed that the design of institutions and incentives could reduce uncertainty and strengthen trust.<sup>12</sup> Then, on the side of organizational behavior, Jones and George consider that trust could promote the organization’s personnel to enhance team performance and cooperation.<sup>13</sup>

In the field of e-commerce, scholars mostly defined trust as the willingness of others to believe in others. In different Consumers reduce to use the electronic payments because of the lack of confidence between most enterprises and consumers. The issue of trust is not only a short-term problem but also the crucial long-term barrier for electronic payments. In both situations, the problems of trust will appear:

---

<sup>9</sup> G. D. Mellinger, "Interpersonal Trust as a Factor in Communication," *The Journal of Abnormal and Social Psychology* (1956).

<sup>10</sup> M. Deutsch, "Cooperation and Trust: Some Theoretical Notes," (1962).

<sup>11</sup> S. Grabner-Krauter, "The Role of Consumers' Trust in Online-Shopping," *Journal of Business Ethics* (2002).

<sup>12</sup> Jeffrey L. Bradach and Robert G. Eccles, "Price, Authority, and Trust: From Ideal Types to Plural Forms," *Annual Review of Sociology* (1989).

<sup>13</sup> Gareth R. Jones and Jennifer M. George, "The Experience and Evolution of Trust: Implications for Cooperation and Teamwork," *The Academy of Management Review* (1998).

when there are situations of risk and uncertainty. Smith defined the risk as a decision that was expressed by a range of possible outcome with an additional probability.<sup>14</sup> It is only an uncertainty when a series of results without hypothetical probabilities. The characteristic of risk is on the possibility of future occurrences and the uncertainty of non-occurrence events. The cognition of risk was first proposed by Bauer. He believed that when consumers involved in trade, they might encounter unpredictable results and it would cause unhappy situations.<sup>15</sup>

The concept of uncertainty was usually defined by knowledge; in other words, it was called insufficient knowledge.<sup>16</sup> Uncertainty was just alike knowledge. For example, one without knowledge cannot have knowledge. Therefore, there will be no uncertainty without one who is uncertain. On the other hand, uncertainty can also be defined as a feeling. This feeling is a quality or qualitative condition.<sup>17</sup> Some scholars thought uncertainty was not a psychological state, but it was a relational concept. It was the part of one's belief state that should be in the same position as one's hypothetical knowledge.<sup>18</sup>

### **The Definition of Trustworthiness**

Hosmer had summed up trust into individual expectation, interpersonal relationship, social structure, and economic transaction respectively. First, an optimistic expectation for the outcome of an event or the behavior of a person. In

---

<sup>14</sup> Nigel J. Smith, Tony Merna, and Paul Jobling, *Managing Risk in Construction Projects* (1999).

<sup>15</sup> R. A. Bauer, "Consumer Behavior as Risk Taking," *Dynamic Marketing for a Changing World* (1960).

<sup>16</sup> P. Montagna, "Uncertainty as a Scientific Concept and Its Application to the Study of Occupations and Organizations," in *Uncertainty: Behavioral and Social Dimensions* (New York, N.Y. : Praeger, 1980).

<sup>17</sup> G. De Zeeuw and W. A. Wagenaar, "Are Subjective Probabilities Probabilities?," in *The Concept of Probability in Psychological Experiments* (1974).

<sup>18</sup> G. F. Smith, P. G. Benson, and S. P. Curley, "Belief, Knowledge, and Uncertainty: A Cognitive Perspective on Subjective Probability," *Organizational Behavior and Human Decision Processes* (1991).

other words, even if that it might be borne to risks or injuries in the future, one was still optimistic. Second, trust often occurred under conditions that were vulnerable to personal interests and dependent on the actions of others; it means that one's optimistic expectation on others when one is in a risky situation. Third, trust usually related to one's willingness rather than be forced cooperation. Forth, trust was limited by contract or level control, and with the negative effects of reducing innovation and cooperation.<sup>19</sup>

After tidying up the literature on the concept of trust, Lane integrated the above-mentioned areas: psychological, social and economic perspectives by summarizing three elements that constitute trust. First one is risk. Consumers must be aware of the possibility of loss and the stakes that they are willing to take. Second one is interdependence. The interests of the group depend on others' ability to get it. The degree of interdependence will also affect the degree of trust. The third one is expectation. It is a belief or expectation that one accepts risk and puts oneself at a disadvantage situation.<sup>20</sup>

If consumers believe electronic payment, then they will trust in electronic payments. It means that consumers have a reliable basis on electronic payments. Grabner-Krauter and Kaluscha pointed out that measuring the technical capabilities of e-commerce websites could use the reliability of software and hardware, the stability of electronic systems and security mechanisms.<sup>21</sup> This was a source of uncertainty for consumers, and it was the factor that could not be avoided by contract before both parties' trade.

---

<sup>19</sup> L. T. Hosmer, "Trust: The Connecting Link between Organizational Theory and Philosophical Ethics," *The Academy of Management Review* (1995).

<sup>20</sup> Kevin Lane Keller, *Strategic Brand Management: Building Measuring and Managing Brand Equity* (Prentice Hall, 1998).

<sup>21</sup> S. Grabner-Krauter and E. A. Kaluscha, "Empirical Research in on-Line Trust: A Review and Critical Assessment," *International Journal of Human-Computer Studies* (2003).

Nowadays, mobile payments apply encryption, firewall and security authentication to reduce the privacy risk to strengthen consumer trust in mobile payments and increase the utilization rate. In addition, it also needs to disclose one's own financial information such as credit card usage period, credit card number, and so on. Therefore, the use of electronic payment does not only involve the consumers' trust, but the security and stability of transactions are also one of the important reasons that affect consumers' use of electronic payments. Moreover, the establishment of a security mechanism can enable consumers to generate trust in electronic payments, so that consumers are willing to trade in a risky environment.

## **METHODOLOGY**

This is a quantitative research. The author used questionnaire survey to collect first-hand data. The parent group I set up can be filled in with or without using electronic payment. According to the three research questions set by this research, the author designed questionnaire. The questionnaire has been carefully designed and delivered to respondents by internet. After questionnaires were collected, the author has carefully checked the validity of questionnaire. Afterward, data has been coded and put forward for data analysis via SPSS software.

### **Questionnaire Design**

The questionnaire has been divided into five parts. First part was basic information of the respondents. This part aimed to understand the sample structure of the respondents. Basic data analysis was analyzed basing on three characteristic variables of gender, age and average monthly income. This research has focused on customers who are at the age of sixteen to forty years old. Therefore, respondents were those people at the age range between sixteen and forty years old.

The age had been divided into 4 groups: sixteen to eighteen, nineteen to twenty-two, twenty-three to thirty, and thirty-one to forty. The reason why the research did such age group arrangement was in line with education system; ie, sixteen to eighteen was senior high school stage; nineteen to twenty-two was college stage, and so on.

The second part of questionnaire aimed to understand privacy risk perception. It means the uncertainty that must be faced when consumers cannot predict when mobile payment intentions are. It mainly measures the privacy risks consumers may experience when using mobile payments. The third part was to measure trustworthiness cognition. In this part, it mainly measured whether consumers

believed that mobile payments were safe and that the information and services provided were honest, reliable and trustworthy. The fourth part was to understand customers' cognition on whether mobile payment was an easy payment tool or not. This part could help to find out if consumers thought whether mobile payment operated methods were simple to use and easy to understand. It mainly measures consumers' experience on using mobile payments. The last part is customers' cognition on motivation of using mobile payments. This is to measure the extent that consumers are willing to use because of a particular behavior (motivation). It mainly measured the extent to which consumers are willing to use mobile payments.

For the detail questionnaire, please see the Appendix 1.

### **Data Collection and Analysis**

This questionnaire was delivered via internet. It was collected randomly. All respondents had to be Taiwanese at the age between sixteen and forty years old.

Except for the first part, the others are measured by the Likert scale. One-point represented disagreed very much, while five-point represented strongly agreed. The higher the score was, the higher the degree of approval earned.

The questionnaire was distributed via internet. It was online questionnaire. It was because online questionnaire was not limited by time and space. Meanwhile, it was easy to issue. However, the disadvantage of one-line questionnaire was that it was impossible to determine whether the respondents met the requirements.

## **DATA ANALYSIS**

In order to answer research questions, this research conducted quantitative analysis. In the quantitative analysis, the responders were randomly sampled between the age of sixteen to forty. According to the three perceptions, the questionnaire was divided into four parts. They are privacy risk, trustworthiness, ease of use, and use motivation respectively. There were 177 questionnaires in total, and the demographic variables of the research were gender, age, monthly income, and using electronic payment or not.

After data was collected. A careful sorting and checking had been processed. After coding all questionnaires, this research applied SPSS's T-test, one-way ANOVA, and Regression to analyze data. It expected this research could clarify whether the differences in gender, age, income, and using electronic payments or not could affect the perception of electronic payments.

### **Reliability Test**

Reliability test is the credibility of individual questions. It could help us to make sure whether the measurements could maintain consistency index. If the alpha value is greater than 0.7, it can be considered to be high valid. If the alpha value is between 0.35 and 0.7, it is considered acceptable. If the alpha value is less than 0.35, it means not value. The reliability test of this research can be found by the table. In reliability analysis, all the attitude scales met reliability standards.



**Table 1.** Cronbach's  $\alpha$  of reliability

Cronbach's $\alpha$	Indicators
$\alpha > 0.7$	High valid
$0.7 > \alpha > 0.35$	Acceptable
$0.35 > \alpha$	No valid

Source: Edited by the author

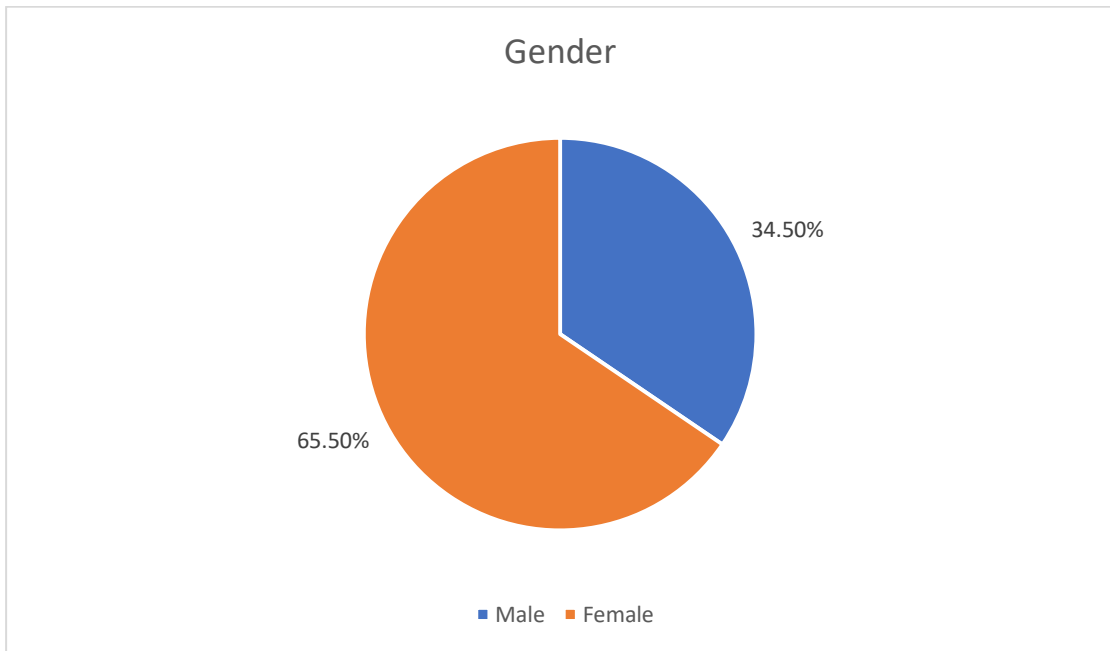
**Table 2.** Reliability analysis

Dimension	Numbers of questionnaire	$\alpha$ value	Result
Privacy risk	7	0.921	High valid
Trustworthiness	6	0.935	High valid
Ease of use	7	0.936	High valid
Use motivation	7	0.897	High valid

Source: Edited by the author

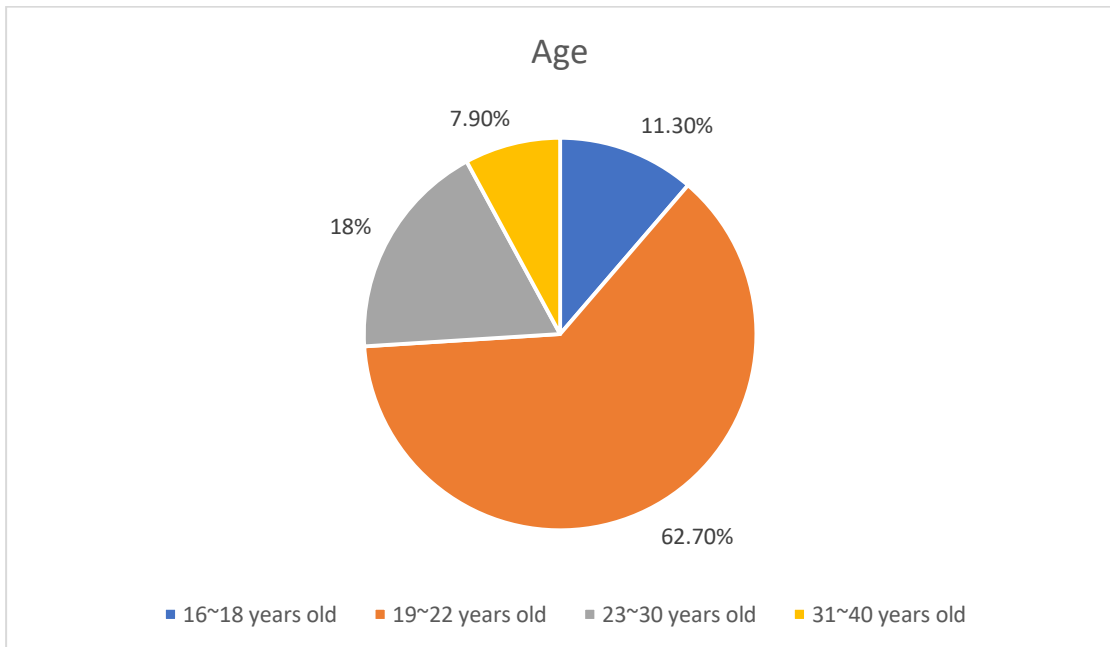
### Descriptive Analysis

According to the response of 177 valid questionnaires, male responders has 34.5%, and 65.5% are female responders. The age distribution shows that the majority of respondents aged 19 to 22 years old, which occupied 62.7% of the total percentage; and following by the people aged 23 to 30 years old, which occupied 18.1%. Monthly income located under NT\$15,000 which is occupied 55.9%. As a result, the respondents almost are students. There are about half of people who use electronic payments and the others do not use electronic payments. Nevertheless, the people who is not used (54.2%) is larger than the people who uses it (45.8%).



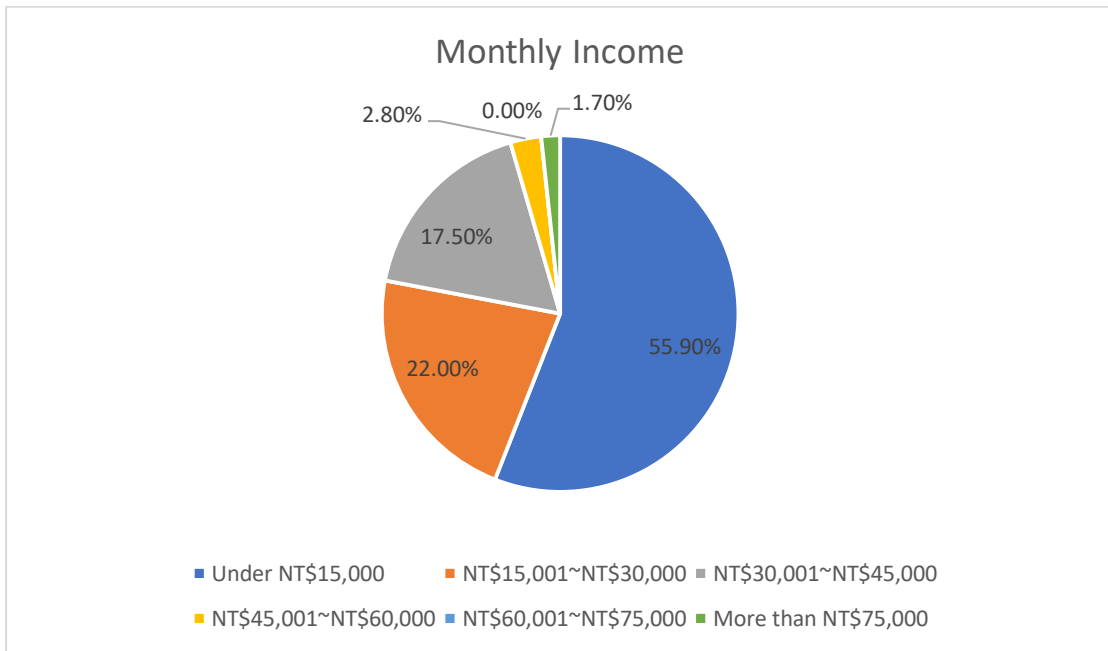
**Figure 3.** Distribution of gender

Source: Edited by the author



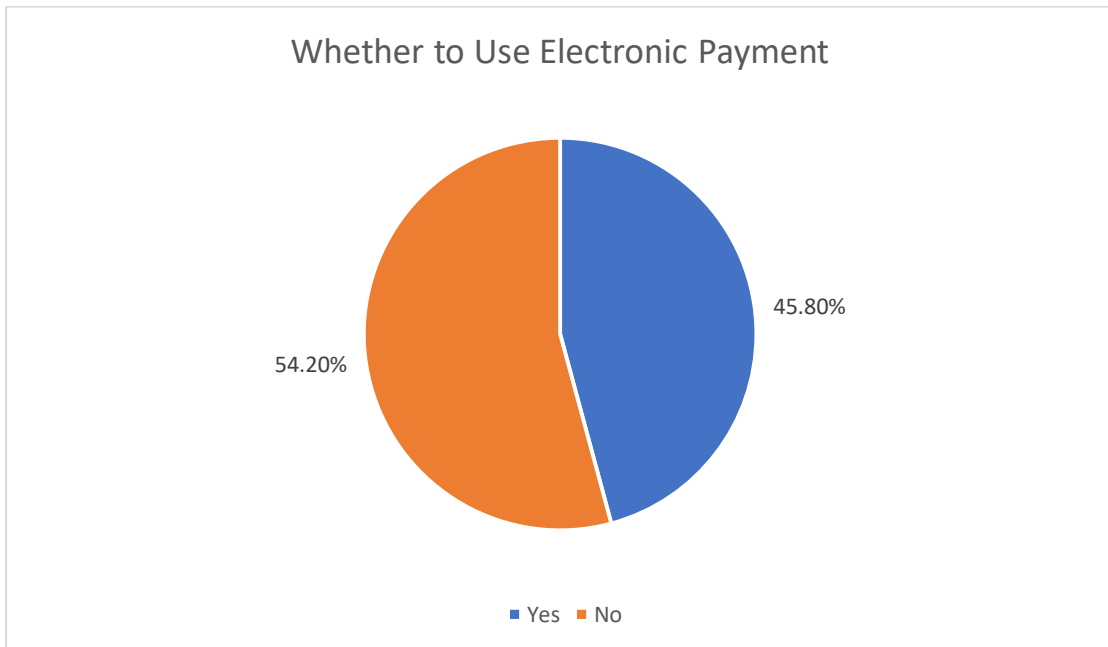
**Figure 4.** Distribution of age

Source: Edited by the author



**Figure 5.** Distribution of monthly income

Source: Edited by the author



**Figure 6.** Distribution of whether respondents use electronic payment

Source: Edited by the author

### Independent Sample T-test

**Table 3.** Comparison of differences in privacy risk, trustworthiness, ease of use and use motivation between different genders.

Verification Variable	Gender	N	Means	S.D.	t value
Privacy risk	Male	61	3.13	1.104	-1.928*
	Female	116	3.44	0.941	
Trustworthiness	Male	61	3.44	0.888	2.457*
	Female	116	3.10	0.883	
Ease of use	Male	61	4.12	0.874	-0.590
	Female	116	4.19	0.743	
Use motivation	Male	61	3.84	0.858	1.141*
	Female	116	3.69	0.827	

p<0.5\*, p<0.01\*\*, p<0.001\*\*\*

Source: Edited by the author

It can be found from the Table 3 that gender variables are statistically significant at the t-test of the four dependent variables, the privacy risk, trustworthiness, ease of use, and use motivation. The significant probability p values are less than 0.5. It showed that male and female had significant differences in the four perceptions. Female's (M=3.44) perceptions of privacy risk (p=0.055) is significantly higher than male's (M=3.13). Male's (M=3.44) perceptions of trustworthiness (p=0.015) is significantly higher than female's (M=3.10). In the perceptions of ease of use (p=0.556) is not significantly because p values are not less than 0.5, which means it does not have relationship between male and female. Male's (M=3.84) perceptions of

use motivation ( $p=0.255$ ) is significantly higher than male's ( $M=3.69$ ).

**Table 4.** Comparison of differences in privacy risk, trustworthiness, ease of use and use motivation between different answers of whether use electronic payments.

Verification Variable	Yes/No	N	Means	S.D.	t value
Privacy risk	Yes	78	3.05	1.043	-3.350**
	No	99	3.55	0.926	
Trustworthiness	Yes	78	3.46	0.891	3.374**
	No	99	3.02	0.856	
Ease of use	Yes	78	4.51	0.580	5.832***
	No	99	3.89	0.827	
Use motivation	Yes	78	4.13	0.674	6.247***
	No	99	3.43	0.828	

$p<0.5^*$ ,  $p<0.01^{**}$ ,  $p<0.001^{***}$

Source: Edited by the author

It can be found from the table 7, whether to use electronic payments variables are statistically significant at the t-test of the four dependent variables which are privacy risk, trustworthiness, ease of use and use motivation. The significant probability p values are less than 0.5. It shows yes and no have significant differences in the four perceptions. No answer's ( $M=3.55$ ) perceptions of privacy risk ( $p=0.001$ ) is significantly higher than yes answer's ( $M=3.05$ ). Next, yes answer's ( $M=3.46$ ) perceptions of trustworthiness ( $p=0.001$ ) is significantly higher than no answer's ( $M=3.02$ ). Yes answer's ( $M=4.51$ ) perceptions of ease of use ( $p=0.000$ ) is significantly higher than no answer's ( $M=3.89$ ). Yes answer's ( $M=4.13$ ) perceptions

of use motivation ( $p=0.000$ ) is significantly higher than no answer's ( $M=3.43$ ).

### One-way Analysis (ANOVA)

**Table 5.** Four different ages on perceptions of privacy risk

Privacy risk

Age	N	Subgroup when alpha=.05
		1
19-22 years old	111	3.25
23-30 years old	32	3.32
16-18 years old	20	3.45
31-40 years old	14	3.83
Sig.		0.258

Source: Edited by the author

The subsequence of four different ages with ANOVA analysis was given in table 8. According to the mean scores in this table, ages in 16-18 years old, 19-22 years old, 23-30 years old, and 31-40 years old held neutral attitude on perceptions of privacy risk. Four groups' attitude level on this factor did not have significant difference, then the mean score of 16-18 years old were 3.45, 19-22 years old were 3.25, 23-30 years old were 3.32, and 31-40 years old were 3.83. Although there was not significant difference on privacy risk, but there were most people still worried about their personal information will be stolen on electronic payments. Except for the above situation, some of them were not have any opinions on privacy risk, which means they were not worried about their personal information or credit cards will be stolen.

**Table 6.** Four different ages on perceptions of trustworthiness

Trustworthiness

Age	N	Subgroup when alpha=.05
		1
31-40 years old	14	2.96
16-18 years old	20	3.18
19-22 years old	111	3.19
23-30 years old	32	3.44
Sig.		0.331

Source: Edited by the author

The subsequence of four different ages with ANOVA analysis was given in table 9. According to the mean scores in this table, ages in 16-18 years old, 19-22 years old, 23-30 years old, and 31-40 years old held neutral attitude on perceptions of trustworthiness. Four groups' attitude level on this factor did not have significant difference, then the mean score of 16-18 years old were 3.18, 19-22 years old were 3.19, 23-30 years old were 3.44, and 31-40 years old were 2.96. Most people did not have any opinions on trustworthiness. It means they were not worried about the security on electronic payments. The other group believes that there is still a possibility of using electronic payment, but they still think it is safe to use it.

**Table 7.** Four different ages on perceptions of ease of use

Ease of use

Age	N	Subgroup when alpha=.05	
		1	2
31-40 years old	14	3.69	
16-18 years old	20	3.84	3.84
19-22 years old	111	4.20	4.20
23-30 years old	32		4.45
Sig.		0.147	0.057

Source: Edited by the author

In the table 10, there were significant differences between these four groups. As was observed, 16-18 years old had 3.84, 19-22 years old had 4.20, 23-30 years old had 4.45, and 31-40 years old had 3.69. All groups of ages had positive attitudes on ease of use on electronic payments. They think electronic payments for them is convenient and easy to use or learn, and electronic payments will not spend too much time to pay.



**Table 8.** Four different ages on perceptions of use motivation

Use motivation

Age	N	Subgroup when alpha=.05
		1
16-18 years old	20	3.48
31-40 years old	14	3.55
19-22 years old	111	3.75
23-30 years old	32	3.96
Sig.		0.261

Source: Edited by the author

The subsequence of four different ages with ANOVA analysis was given in table 11. According to the mean scores in this table, ages in 16-18 years old, 19-22 years old, 23-30 years old, and 31-40 years old have a neutral attitude toward the use motivation. Four groups' attitude level on this factor did not have significant difference, then the mean score of 16-18 years old were 3.48, 19-22 years old were 3.75, 23-30 years old were 3.96, and 31-40 years old were 3.55. Although the result did not have significant, most people (about 59.9%) still prefer to use electronic payments in the future, while others (about 28.8%) have no opinion.

## Multiple Linear Regression

**Table 9.** Pearson Correlation Analysis

Means, Standard Deviations, and Correlations						
Variable	Mean	S.D.	1	2	3	4
Privacy risk	3.33	1.007				
Trustworthiness	3.21	0.897	-0.457**			
Ease of use	4.17	0.789	-0.182*	0.450**		
Use motivation	3.74	0.839	-0.295**	0.656**	0.755**	
Monthly income	1.74	1.028	-0.058	0.149*	0.113	0.172*

p<0.1+, p<0.05\*, p<0.01\*\*, p<0.001\*\*\*

Source: Edited by the author

**Table 10.** Linear Regression Analysis

Standardized Regression Coefficients from Analysis Trustworthiness (N=177)	
Independent Variable	Model 1
Monthly income	0.149*
Model F	3.983*
$\Delta F$	3.983
$R^2$	0.022
$\Delta R^2$	0.022
Adjusted $R^2$	0.017

p<0.1+, p<0.05\*, p<0.01\*\*, p<0.001\*\*\*

Source: Edited by the author

**Table 11.** Linear Regression Analysis

Standardized Regression Coefficients from Analysis Use Motivation (N=177)	
Independent Variable	Model 1
Monthly income	0.172*
Model F	5.356*
$\Delta F$	5.356
$R^2$	0.030
$\Delta R^2$	0.030
Adjusted $R^2$	0.024

p<0.1+, p<0.05\*, p<0.01\*\*, p<0.001\*\*\*

Source: Edited by the author

From the above tables, Monthly income has no positive influence on the perception of privacy risk ( $p=0.447$ ) and ease of use ( $p=0.133$ ), which means their F verification has not passed. The p values were all less than 0.05. Therefore, it could figure out that no matter how monthly income was high or low, it does not relate to the perception of privacy risk and ease of use. Monthly income has a positive influence on the perception of trustworthiness ( $\beta=0.149$ ;  $p=0.048$ ) and use motivation ( $\beta=0.172$ ;  $p=0.022$ ). Although the results were significant, the significance were not obvious.

## CONCLUSION

This research understood Taiwanese's perception on electronic payments through questionnaire. According to literature review, this research proposed three research questions. The research questions would be elucidated by the findings.

The first research question was why people did not use electronic payments or why they used electronic payments. From the results of data analysis, half of the people were using electronic payment. Moreover, the people who were not using (54.2%) were larger than those who use it (45.8%). People who used electronic payments was because they thought that electronic payments were convenient and easy to use. They also thought electronic payments were helpful for their life and increased their purchase desire. On the other hand, those who were not using electronic payments were because they had no habit of using them originally. And some of them worried that their money or credit cards would be stolen.

The second research question aimed to understand the relationship between people's perceptions and electronic payments. The last research question aimed to find out the cognitions influence on the use of electronic payments. In order to make life more convenient, electronic payments in various countries including Taiwan have continued to develop in recent years. People are closely related to these cognitions. Those four perceptions that mentioned about literature review influence the people whether to use electronic payments. Through data analysis, most people were biased towards neutral or positive attitudes on electronic payments. All in all, although people thought electronic payments still existed risk, they thought electronic payments made life easier and more convenient. Electronic payment companies can start with security, because this is the most worrying issue. Then, government or company could promote electronic payments. The author believe that more and more

people would be willing to join the group of using electronic payments in the future.

Even foreigners who travel to Taiwan could also use electronic payments.

## APPENDIX

親愛的填答者，您好：

首先感謝您撥冗協助填寫！此問卷是為進行我的大學畢業論文所進行的資料收集；論文的研究目的是要了解民眾對電子支付的認知，以及對電子支付的影響。本問卷採不記名方式進行，填答資料僅作為學術研究之用，絕對不會對外公開。請您放心填答，您的寶貴意見，將為本研究提供極大貢獻，感謝您的填答！

敬祝 身體健康 平安快樂

文藻外語大學 國際事務系

學生 陳靜柔

指導教授 陳玉珍

### 一、基本資料

本資料僅供學術研究之用，絕不對外公開，並絕對保密，請您放心作答。

1. 性別：

女 男

2. 年齡：

16~18 歲 19~22 歲 23~30 歲 31~40 歲

3. 平均月收入(零用錢)：

15,000 元以下 15,001~30,000 元 30,001~45,000 元

45,001~60,000 元 60,001~75,000 元 75,001 元以上

4. 請問您是否有使用電子支付？

是 否

5. 電子支付類型：

Apple Pay Samsung Pay Google Pay

其他：\_\_\_\_\_

## 二、隱私風險認知

為了解民眾對於電子支付的認知隱私風險，請您依據個人的實際狀況和感覺，在□中打「√」。

		非常不同意	不同意	無意見	同意	非常同意
1.	我擔心我在【電子支付】的個人資料會被竊取。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	我擔心我在【電子支付】的個人資料會被濫用。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	我擔心我的【電子支付】會被盜刷。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	我擔心【電子支付】的錢，可能比實際售價還要多。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	我擔心我在【電子支付】上的交易紀錄，會被監控。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	我認為我把我的個人資料給【電子支付】，將會有高度的潛在損失。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	我認為把我的個人資料給【電子支付】，將有太多的不確定性。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## 三、可信賴度認知

為了解民眾對於電子支付可信賴度的認知，請您依據個人的實際狀況和認知，在□中打「√」。

		非常不同意	不同意	無意見	同意	非常同意
1.	我認為【電子支付】不會對不相關的人透漏我的個人資料。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	我認為在使用【電子支付】的過程中，我的個人資料不會外洩。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	我認為【電子支付】的交易安全保障機制，是可靠的。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	我認為在【電子支付】上進行交易，是安全的。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	我認為【電子支付】，是值得信賴的。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	我認為【電子支付】給予我信任感。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

#### 四、易用性認知

為了解民眾對於電子支付的認知易用性，請您依據個人的實際狀況和認知，在□中打「√」。

		非常不同意	不同意	無意見	同意	非常同意
1.	對我而言，學習操作【電子支付】是容易的。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	對我而言，使用【電子支付】是清楚明瞭的。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	我認為【電子支付】可以很容易讓我買到想買的商品。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	我認為使用【電子支付】付款不會花太多時間。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	我認為使用【電子支付】能提升我的購物效率。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	我認為使用【電子支付】是簡單、好操作的。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	我認為使用【電子支付】是方便的。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

#### 五、使用動機認知

為了解民眾對於電子支付的使用動機，請您依據個人的實際狀況和認知，在□中打「√」。

		非常不同意	不同意	無意見	同意	非常同意
1.	我認為使用【電子支付】會提升我的消費慾望。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	我認為【電子支付】對我的生活是有幫助的。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	我認為【電子支付】的優惠，是吸引我的。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	我認為我有足夠的能力使用【電子支付】。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	我認為【電子支付】是很好的主意。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	我願意向其他人推薦【電子支付】。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	未來六個月內，我有意願使用【電子支付】。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

【本問卷到此結束，煩請您檢查是否有遺漏之處，再次感謝您的耐心填答！】



## BIBLIOGRAPHY

- Asokan, N., P. A. Janson, M. Steiner, and M. Waidner. "The State of the Art in Electronic Payment Systems." *Computer* (1997): 28-35.
- Bauer, R. A. "Consumer Behavior as Risk Taking." *Dynamic Marketing for a Changing World* (1960): 389-98.
- Bradach, Jeffrey L., and Robert G. Eccles. "Price, Authority, and Trust: From Ideal Types to Plural Forms." *Annual Review of Sociology* (1989): 97-118.
- De Zeeuw, G., and W. A. Wagenaar. "Are Subjective Probabilities Probabilities?". In *The Concept of Probability in Psychological Experiments*, 73-101, 1974.
- Deutsch, M. "Cooperation and Trust: Some Theoretical Notes." 275-320, 1962.
- Donner, Jonathan, and Camilo Andres Tellez. "Mobile Banking and Economic Development: Linking Adoption, Impact, and Use." *Asian Journal of Communication* (2008): 318-32.
- Goeke, Laura, and Key Pousttchi. "A Scenario-Based Analysis of Mobile Payment Acceptance." 371-78. 2010 Ninth International Conference on Mobile Business and 2010 Ninth Global Mobility Roundtable (ICMB-GMR), 2010.
- Grabner-Krauter, S. "The Role of Consumers' Trust in Online-Shopping." *Journal of Business Ethics* (2002): 43-50.
- Grabner-Krauter, S., and E. A. Kaluscha. "Empirical Research in on-Line Trust: A Review and Critical Assessment." *International Journal of Human-Computer Studies* (2003): 783-812.
- "Advantages and Disadvantages of E-Payment." 2018, <https://bizfluent.com/info-8188352-advantages-disadvantages-epayment.html>.

- Hosmer, L. T. "Trust: The Connecting Link between Organizational Theory and Philosophical Ethics." *The Academy of Management Review* (1995): 379-403.
- Jones, Gareth R., and Jennifer M. George. "The Experience and Evolution of Trust: Implications for Cooperation and Teamwork." *The Academy of Management Review* (1998): 531-46.
- Keller, Kevin Lane. *Strategic Brand Management: Building Measuring and Managing Brand Equity*. Prentice Hall, 1998.
- "What a Cashless Society Could Mean for the Future." 2018, <https://www.forbes.com/sites/vishalmarria/2018/12/21/what-a-cashless-society-could-mean-for-the-future/#43627ee23263>.
- Mellinger, G. D. "Interpersonal Trust as a Factor in Communication." *The Journal of Abnormal and Social Psychology* (1956): 304-09.
- Montagna, P. "Uncertainty as a Scientific Concept and Its Application to the Study of Occupations and Organizations." In *Uncertainty: Behavioral and Social Dimensions*: New York, N.Y. : Praeger, 1980.
- "Three Pay Assistance, Mobile Payment Transactions Increase 6 Times." 2018, <http://technews.tw/2018/06/08/big-3-pays-help-tw-mobile-pay-grow-6-times/>.
- "Electronic Payment Systems - Computer Definition." 2010, <https://www.yourdictionary.com/electronic-payment-systems>.
- Smith, G. F., P. G. Benson, and S. P. Curley. "Belief, Knowledge, and Uncertainty: A Cognitive Perspective on Subjective Probability." *Organizational Behavior and Human Decision Processes* (1991): 291-321.
- Smith, Nigel J., Tony Merna, and Paul Jobling. *Managing Risk in Construction Projects*. 1999.

Wróbel-Konior, Sandra, "What Is an E-Payment System?," 2018,  
<https://securionpay.com/blog/e-payment-system/>.