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**Analysis of influencing factors of online payment in China**

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for the Bachelor of Science in Finance

by

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## **Abstract**

E-commerce is a revolution in the history of human development. It has completely changed traditional business models and strategies with a new type of information technology and digital means. With the rapid development of information technology and network technology, e-commerce has made great progress in recent years, and has gradually penetrated into all aspects of social and economic life. Online payment is an important part of e-commerce. Without the use of online payment, e-commerce will not develop as it does today. This paper revolves around four research questions, which are What are the advantages and disadvantages of online payment like Alipay and WeChat pay? What factors play a crucial role in the success of online payments like Alipay and WeChat pay in China? What impact does online payment like Alipay and WeChat pay have on the daily lives of the Chinese people? What are the current problems with online payment like Alipay and WeChat pay in China and how should we improve? Based on the data from the report of the China Internet Network Information Center (CNNIC), I made three hypotheses. Moreover, in the part of analysis and finding, this paper launched an analysis of the influencing factors of online payments and finally came up with a model.

## 1. Introduction

With the development of the times and the advancement of technology, China is in the high-speed growth period of the online payment industry, and China's online payment technology has taken the lead in the world. The main factors driving the growth of the online shopping industry in the future are the rapid development of China's Internet and the vast consumption potential of Chinese people. It is undeniable that online shopping is recognized by more and more Chinese people for its convenience and easy to use, especially for the new generation of young people. In China, online payment has always been a topic that people are passionate about. The reason is that in today's China, whether it is online shopping or offline payment, only a few people use cash or credit card, most people use mobile phones to pay.

Online payment refers to payment through electronic products such as mobile phones and computers to purchase products that people want. China's online payment era began with the rise of Alibaba's business. Alibaba was founded in 1999. In December 2004, Alibaba Group affiliated company launched Alipay, which is a third-party online payment platform. Due to the emergence of Alipay, China's online payment and online shopping industry has developed rapidly. In today's China, fewer and fewer people will go out with cash, whether in a supermarket or a small grocery store, as long as there is a mobile phone, then people can buy the goods they want to buy. Therefore, there is no doubt that online payment makes Chinese life more convenient. According to a report from the China Internet Network Information Center (CNNIC), in 2018, about 583 million people in China use mobile payments, an increase

of 10.7% over 2017. Moreover, people prefer to use mobile phones when they shop offline, such as Alipay and WeChat payment. The data shows that about 67.2% of Chinese Internet users use mobile payments offline, up from 65.2% in 2017. (CNNIC) Therefore, online payment is becoming more and more important for Chinese people, and it has also changed the lives of Chinese people.

There are two primary online payment methods in China, namely Alipay and WeChat pay. According to the report of WALKTHECHAT, about 93.3% of people use WeChat pay and Alipay to purchase goods. Moreover, relatively speaking, the popularity of WeChat pay is higher, which is reaching 86.4%, mainly because people use WeChat more frequently. (WALKTHECHAT) There are three reasons why people prefer to use WeChat Pay. The first one is WeChat Pay is a subsidiary function developed on WeChat, which has strong social attributes. However, for Chinese people, Alipay has no other advantages than online shopping and mobile electronic payment. The second reason is that WeChat card coupons launched by WeChat make it easy for merchants to use WeChat to help their stores deliver coupons, so that people can get a lot of coupons if they use WeChat Pay. Thus, online payment is an essential tool in people's daily lives.

The main content of this paper is to analyze mobile payment and offline payment in e-commerce based on the actual situation in China. The online payment here mainly refers to Alipay and WeChat pay. There are four minor problems under this general theme, which is that, What are the advantages and disadvantages of online payment like Alipay and WeChat pay; What factors play a crucial role in the success of online

payments like Alipay and WeChat pay in China; What impact does online payment like Alipay and WeChat pay have on the daily lives of the Chinese people; and What are the current problems with online payment like Alipay and WeChat pay in China and how should we improve.

## **2. Literature review**

### **2.1 Advantages and Disadvantages of online payment**

There is a lot of research has been done on the topic of online payment. Qinghua Zhang proposes that online payment mainly has two forms, which are mobile fee account payment and bank card mobile payment. He listed the advantages and disadvantages of mobile fee payment and bank card mobile payment respectively, and compared these two online payment methods. First, the advantage of mobile fee account payment is that it is less risky, convenience and quickness. However, mobile fee account payment also has some shortcomings, such as restriction of mobile fees, confusing management of call fees, the hidden danger of using public money for private purposes, and weak guarantee for trading security. Second, the advantage of the bank card mobile payment is that it has a powerful security guarantee, abundant functions and it is easy to manage. Moreover, bank card mobile payment also has some disadvantages, like high risks, cross-industrial operations, high utilization cost and technical doorsill for mobile phone card and so on. (Q. Zhang, 2008) Sarabjit Jagirdar puts forward her views on the same problem, namely the advantages of online payment. In this paper, she explains the benefits of online payments to people. For example, online payment dramatically facilitates people's daily life, people will no longer need to go shopping in the market, spend hours in traffic jams, or queue up to pay for utility bills, and it is safe. (Sarabjit Jagirdar, 2009)

Zexi An, Xuecheng Yang, and Tong Wu proposes the developing barriers of online

payment through the detailed analysis of the mobile payment industry chain. There are three barriers, which is that, the significant investment cost, the problem of trust and security, and the poor cooperation between each stakeholder in its industry strain. (Z. An & X. Yang & T. Wu, 2010) Yongqiang He, Yanrong Shi, and Aixiang He expounds a standard online payment system model and focusing on three online payment modes: electronic credit card, electronic cash and electronic check. Finally, they point out the application environment of each of these three modes. The advantages of these three modes are online payment is fast, convenient, and cheap; online payments place high demands on software and hardware facilities; and online payments are used to pay various amounts of money digitally. (Y. He, Y. Shi & Aixiang, 2010)

## **2.2 Crucial factors for online payment success in China**

In addition to the investigation of the advantages and disadvantages of online payment, there are also many papers on the issues of crucial factors for Alipay and WeChat payment success in China. Wai-Ming To and Linda S.L. Lai examines the development of China Mobile Banking and mobile payments, and the opportunities and obstacles of mobile payments in China. They explain this problem is two different aspects, the first one is the opportunity for growth, and the second one is barriers to acceptance. There are three opportunities, the size of the market, the use of existing relationship networks to gain social recognition, and make mobile banking and payment as simple as possible. In addition to opportunities, there are also two barriers, which is that, security and trust, and a technology gap for some potential users. (Wai-Ming To & Linda S.L. Lai, 2014) In other words, Ali payment and WeChat payment need

to grasp three opportunities to achieve greater success, in the meantime, they also need to overcome these obstacles. Lijun Ma uses the extended technology acceptance model to explore the factors that influence consumers' use of mobile payments. According to the research of Lijun Ma, we can see that there are three factors, the most important part is trust, and the second one is the loss caused by information risk is lower than financial risk. (Lijun Ma, 2018) In other words, because of these three elements, people are more willing to use online payment, which has created the success of Alipay and WeChat payment.

### **2.3 The impact of online payments on the Chinese people**

The next question is, what impact does online payment like Alipay and WeChat pay have on the daily lives of the Chinese people? Atlanta explains the impact of online payment on people's daily life from the perspective of patients. In her view, online payment had changed the way of life of patients to some extent, such as there are fewer incoming calls, the patient became happier than before because the online payment was very convenient, which saved them much time and they no longer need to deal with many complicated matters. (Atlanta, 2011) In general, the most important impact of online payments on people's lives is that they save a lot of people's time. Jean-Michel Sahut explains the impact of online payments on people's daily lives from the perspective of competition in the same industry. All the author's views are from the perspective of the bank, the author points out that Banks no longer dominate capital flows, losing control over their creation and their profits are no longer stable as before. (Jean-Michel Sahut, 2008) Therefore, the author's conclusions show that the

impact of online payments on the banking industry is huge. In other words, online payment has replaced some of the bank's business to a certain extent.

## **2.4 Problems and solutions**

The last question addresses the problems at the current stage of online payment in China like Alipay and WeChat Pay and how it should be improved. Guoling Lao and Shanshan Jiang analyzed the risks faced by online payment in terms of politics, economy, society and technology. At the same time, this paper also takes Alipay as an example to provide some suggestions for enterprises to identify and respond to these risks. Lao discusses his views from four aspects, namely political elements, economic elements, technical elements and social elements. From the aspect of the political elements, online payment has four risks, which is that, qualification for market access, limitation of payment, the legal status of payment platform and legal responsibility. From the aspect of economic elements, there is no risk in general, but there will be some small fluctuations. From the aspect of social elements, buyers are increasingly sensitive to product quality, and their choice of goods is growing, which will lead to vicious competition among merchants, which will lead to "price war". From the aspect of technology elements, lower technical requirements and industry barriers have attracted new entrants to the market, which has led to market saturation. (Guoling Lao & Shanshan Jiang, 2009) Yuan-ping Cai and Yu-ying Wang also discussed the risks of online payments and how we should prevent them. There are three main risks in online payment, which is that, security risk, credit risk and legal risk. Security risks mainly refer to password management and network virus intrusion; credit risk refers

to the fact that the authenticity of the transactions between the two parties is not easy to check, so online scams are prevalent in online shopping. Legal risks mainly refer to inevitable conflicts between electronic checks and traditional laws, and their effectiveness also has certain controversies. (Yuan-ping Cai & Yu-ying Wang, 2011)

### **3. Methodology and Data**

#### **3.1 Data and Sample**

In China, the mobile payment industry is developing rapidly. The problem is what factors are driving the development of the mobile payment industry. In other words, what factors play a crucial role in the success of online payments like Alipay and WeChat pay in China? In view of this problem, the main content of this part is to show data and sample on this issue.

The sample of this study is Chinese Internet users, and the data comes from the China Internet Network Information Center (CNNIC), which is the National Network Infrastructure Resources Operation Management and Service Agency. The data extracted is quarterly data, which is from the first quarter of 2015 to the second quarter of 2019.

There are many factors that affect third-party payments, this study mainly extracts several factors from the macro level. Moreover, there are mainly three factors that affect the amount of online payment consumption, which are the time spent on mobile per week, the quantity of mobile netizens and the number of mobile phone base stations. Therefore, the variables as follows:

X1 is denoted as the time spent on mobile per week. According to Statista, an adult spends an average of 217 minutes on the mobile phone every day, and 120 minutes on the PC. From 2012 to 2014, this curve has been rising steadily, which means

that people spend more time on apps than PCs. This means that people use their phones more frequently.

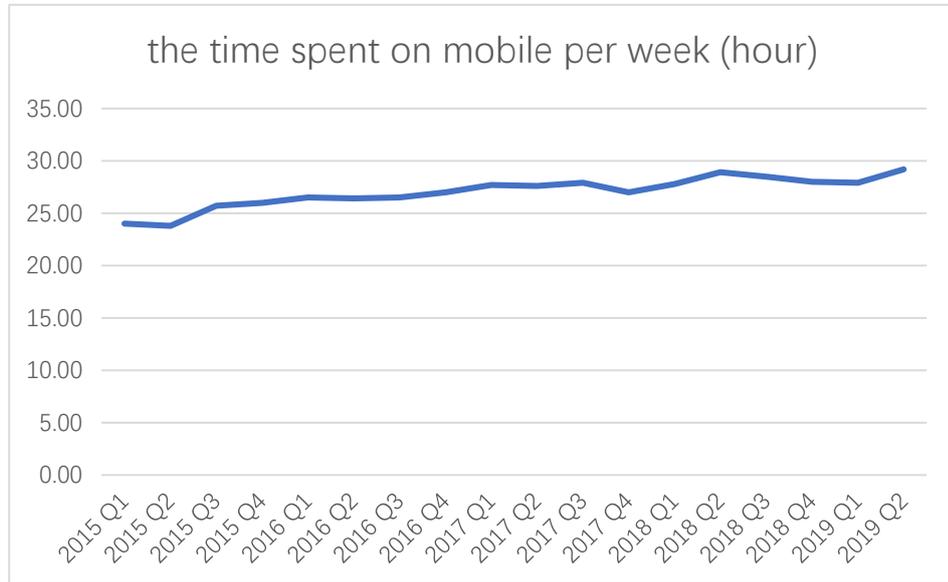


Figure 1 the time spent on mobile per week

X2 is denoted as the quantity of mobile netizen. According to the China Internet Network Information Center (CNNIC), in the second quarter of 2019, China Mobile netizen have reached about 853 million. It increased by 30 million compared with the last quarter of 2018;

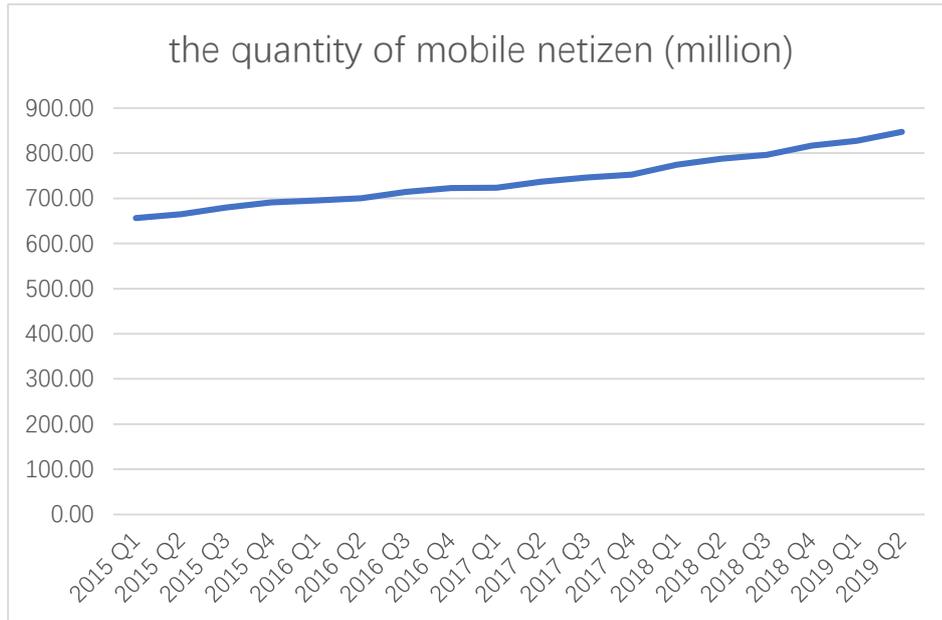


Figure 2 the quantity of mobile netizen

X3 is denoted as the number of mobile phone base stations. In 2017, the process of network infrastructure construction continued to accelerate. In the first three quarters, 447,000 mobile communication base stations were added, and the total number of base stations is 6.041 million. The total number of 3G/4G base stations reached about 6.48 million in that second quarter of 2019.

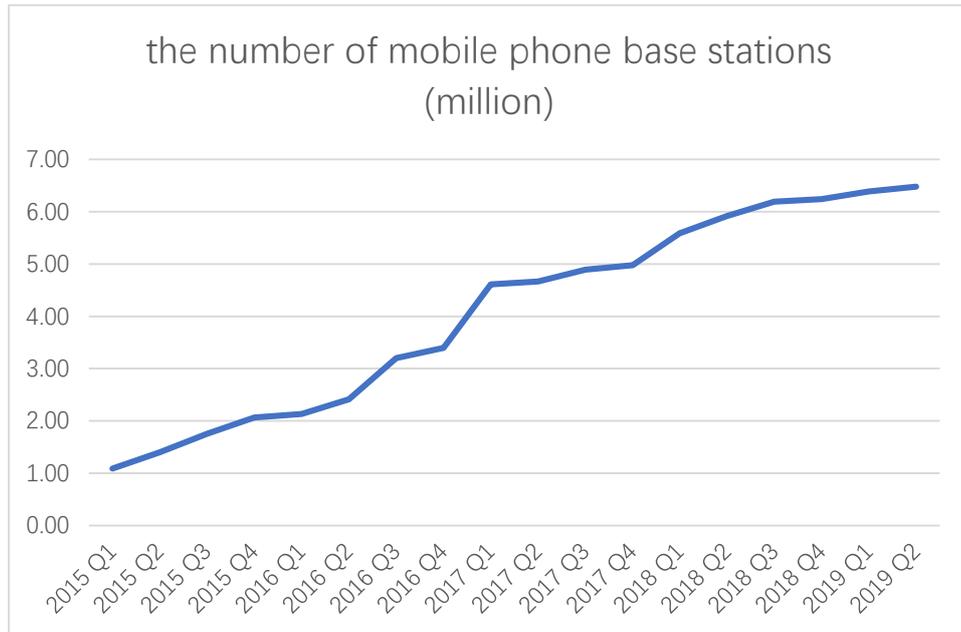


Figure 3 the number of mobile phone base

Y is denoted as the amount of online payment consumption. According to the data from China Internet Network Information Center (CNNIC), I got the online payment transaction amount from the first quarter of 2015 to the second quarter of 2019, which is maintain a sharp upward trend each year. It is shows that the degree of Chinese acceptance of online payments is increasing year by year.

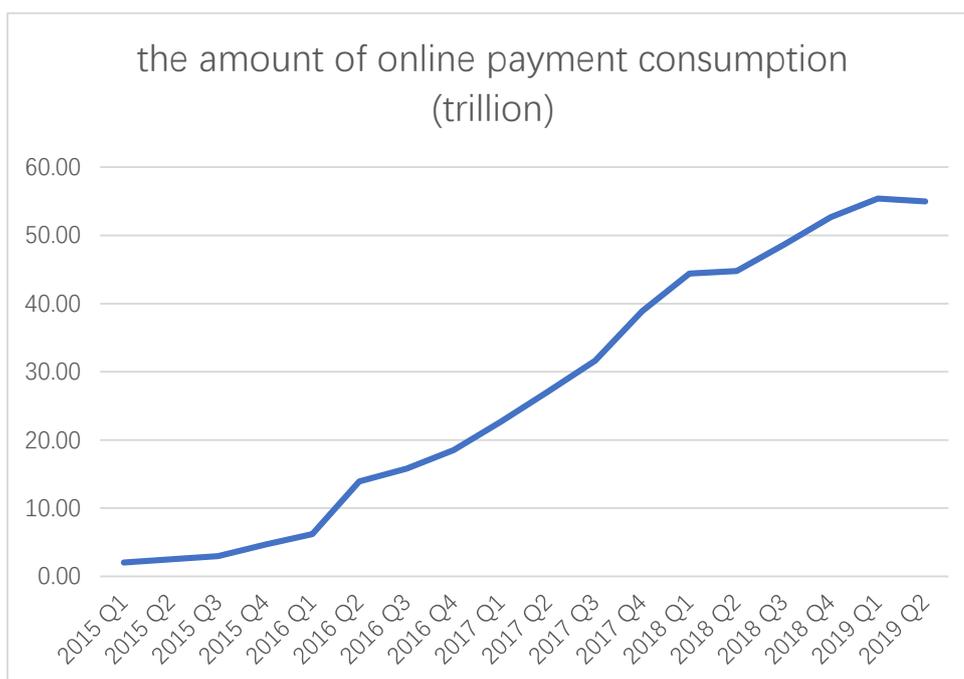


Figure 4 the amount of online payment consumption

### 3.2 Methodology and Model

The main problem is to examine the relationship and the degree of correlation between the three independent variables and the dependent variable, namely the amount of mobile payment. I will use a quantitative method and regression analysis in this study. Based on the above independent variables and dependent variable, the model of the study as follows:

***The amount of online payment consumption = a1 \* the time spent on mobile per week + a2 \* the quantity of mobile netizen + a3 \* the number of mobile phone base stations + ε***

There are four research questions of this study, which are what are the advantages and disadvantages of online payment like Alipay and WeChat pay? What factors play a

crucial role in the success of online payments like Alipay and WeChat pay in China?  
What impact does online payment like Alipay and WeChat pay have on the daily lives of the Chinese people? What are the current problems with online payment like Alipay and WeChat pay in China and how should we improve?

Based on the research questions, there are three hypotheses as follows:

H1: the time spent on mobile per week does not have the impact on the amount of online payment consumption;

H2: the quantity of mobile netizen does not have the impact on the amount of online payment consumption;

H3: the number of mobile phone base stations does not have the impact on the amount of online payment consumption.

In the next part, I will do a regression analysis and decide whether to reject or accept the hypothesis.

## 4. Analysis and Findings

According to the data from China Internet Network Information Center (CNNIC), after using regression analysis, the following results were obtained:

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	-38.61635062	30.4788374	-1.26699	0.225831	-103.987	26.75425
X Variable 1	-3.378506047	0.905717491	-3.7302	0.002239	-5.32108	-1.43594
X Variable 2	0.169609034	0.034187815	4.961096	0.000209	0.096283	0.242935
X Variable 3	7.697409922	1.210742106	6.357597	0.007805	5.100626	10.29419

Table 1 The result of regression analysis

The coefficient of intercept, X1, X2 and X3 respectively are 38.616, 3.379, 0.169 and 7.697. Therefore, the result of model as follows:

$$Y = -38.616 - 3.378X_1 + 0.169X_2 + 7.697X_3$$

Bases on the previous analysis, there are three hypotheses of this research. The first one is the time spent on mobile per week does not have the impact on the amount of online payment consumption. In this research, the level of significance  $\alpha=0.05$ . According to the Table 1, the P-value of the X1 is 0.002239. Therefore, it can reject the

HO. In other words, it is true that the time spent on mobile per week significantly influences the amount of online payment consumption.

The second one is the quantity of mobile netizen does not have the impact on the amount of online payment consumption. According to the Table 1, the P-value of the X2 is 0.000209. Therefore, it can reject the HO. In other words, it is true that the quantity of mobile netizen significantly influences the amount of online payment consumption.

The third one is the number of mobile phone base stations does not have the impact on the amount of online payment consumption. According to the Table 1, the P-value of the X3 is 0.007805. Therefore, it can reject the HO. In other words, it is true that the number of mobile phone base stations significantly influences the amount of online payment consumption.

My results are consistent with those of Linye Mao and Shaogang Chen (2015) showing that the quantity of mobile netizen significantly influences the amount of online payment consumption and the number of 4G base stations significantly influences the amount of online payment consumption.

The research question of this study is, "What factors play a crucial role in the success of online payments like Alipay and WeChat pay in China?" In general, according to my result, there are three factors that affect the success of online payment like Alipay and WeChat pay in China, which are the time spent on mobile per week, the quantity of mobile netizens and the number of mobile phone base stations. Among

these factors, the number of mobile phone base stations and the time spent on mobile per week has the greatest effect on the success of online payments.

W. To and Linda S.L. Lai (2014) examines the development of China Mobile Banking and mobile payments, they suggest that the market size is important to the success of online payment. It is consistent with one of my results, which is the quantity of mobile netizen has the significant effect on the success of online development. The greater the number of mobile netizens, the larger the market for mobile payments. Then, the amount of online payment consumption will also be larger than before.

## 5. Conclusion

This paper mainly finds the factors that affect the success of online payments like Alipay and WeChat Pay in China, which are the time spent on mobile per week, the quantity of mobile netizen and the number of mobile phone base stations. Present literature discusses how a relatively successful mobile payment ecosystem is created and maintained through the cooperation of various participants. Moreover, they also use the extended technology acceptance model to explore the factors that influence consumers' use of mobile payments. According to the most important research question of this study: What factors play a crucial role in the success of online payments like Alipay and WeChat pay in China? This paper analyzes the regression equation between three independent variables and one dependent variable. The sample of this research is Chinese internet user and the data mainly comes from the report of China Internet Network Information Center (CNNIC). At last, based on the significant analysis, it can conclude that all of these three independent variables are significantly influence the amount of online payment.

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## 7. Tables and Figures

Table 1 The result of regression analysis

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
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X Variable 3	7.697409922	1.210742106	6.357597	0.007805	5.100626	10.29419

Figure 1 the time spent on mobile per week

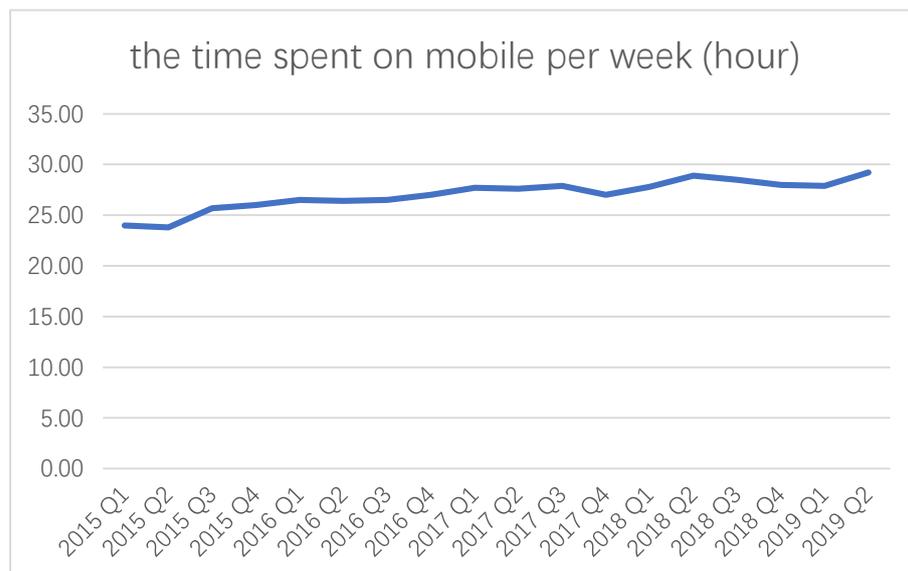




Figure 2 the quantity of mobile netizen

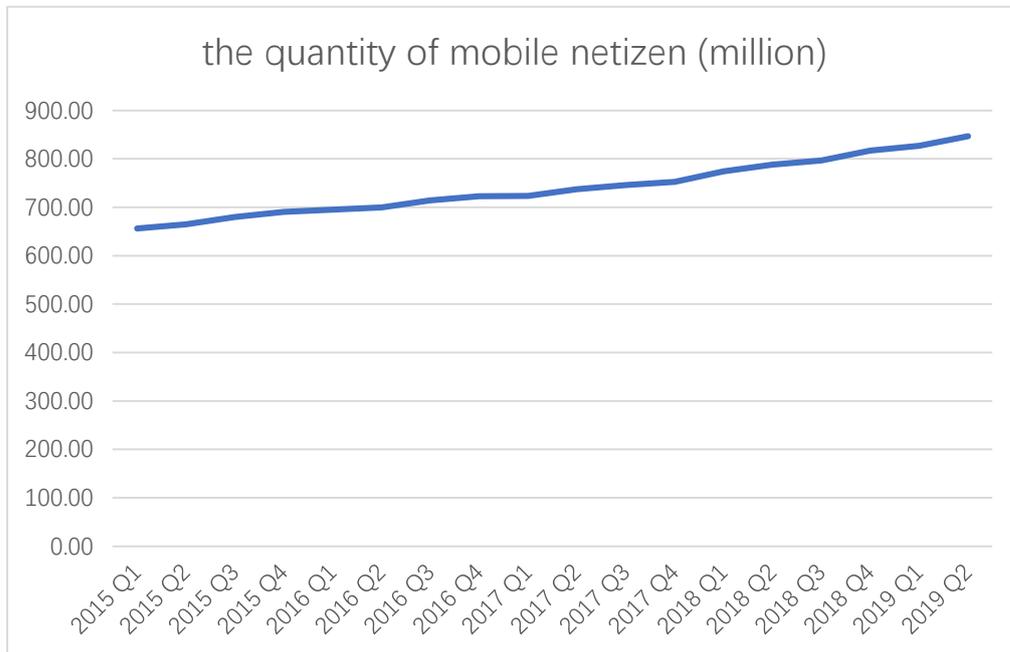


Figure 3 the number of mobile phone base stations

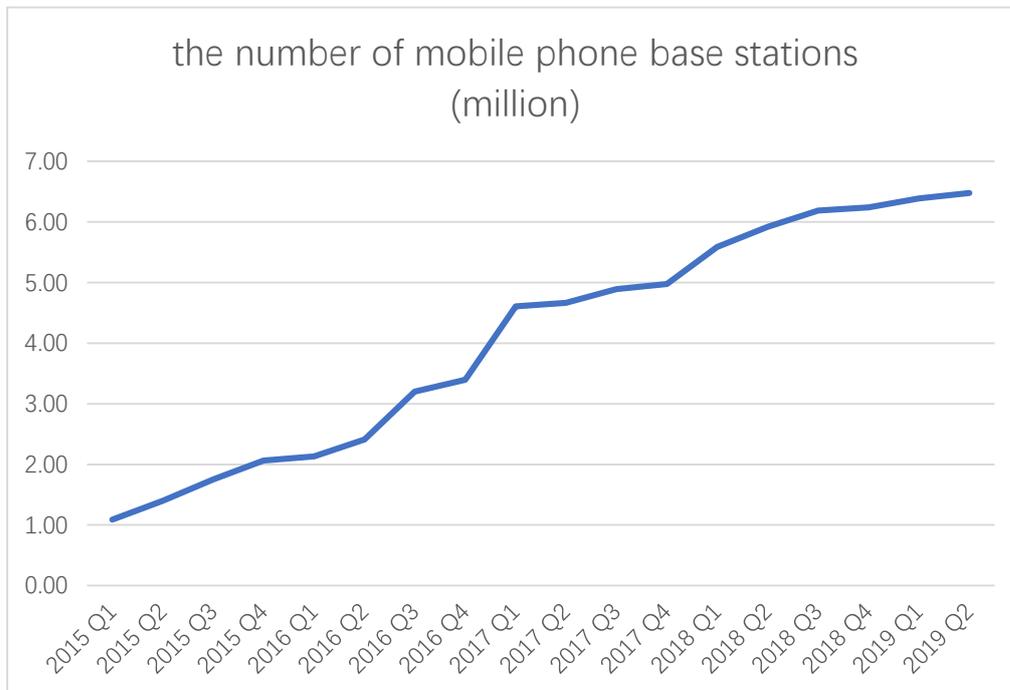
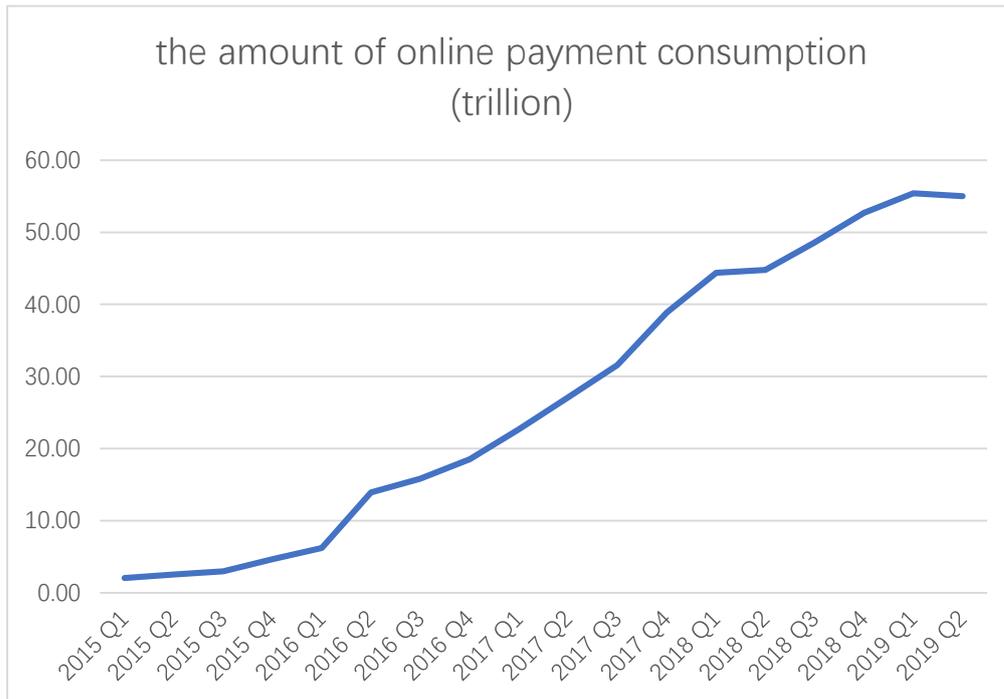




Figure 4 the amount of online payment consumption



## 8. Appendix

### 8.1 Appendix A

	the time spent on mobile per week (hour)	the quantity of mobile netizen (million)	the number of mobile phone base stations (million)	the amount of online payment consumption (trillion)
2015 Q1	24.00	656.37	1.09	2.05
2015 Q2	23.80	664.78	1.40	2.52
2015 Q3	25.70	679.84	1.75	2.98
2015 Q4	26.00	690.70	2.07	4.65
2016 Q1	26.50	695.31	2.13	6.20
2016 Q2	26.40	699.81	2.41	13.90
2016 Q3	26.50	714.23	3.20	15.80
2016 Q4	27.00	722.68	3.40	18.50
2017 Q1	27.70	723.61	4.61	22.70
2017 Q2	27.60	736.89	4.67	27.10
2017 Q3	27.90	745.70	4.89	31.60
2017 Q4	27.00	752.65	4.98	38.90
2018 Q1	27.80	774.35	5.59	44.40
2018 Q2	28.90	787.74	5.92	44.80
2018 Q3	28.50	796.39	6.19	48.60
2018 Q4	28.00	816.89	6.24	52.70
2019 Q1	27.90	827.19	6.39	55.40
2019 Q2	29.20	846.81	6.48	55.00

### 8.2 Appendix B

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Regression Statistics	
Multiple R	0.994538623
R Square	0.989107073
Adjusted R Square	0.986772875
Standard Error	2.269279145
Observations	18

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	df	SS	MS	F	Significance F
Regression	3	6546.40101	2182.134	423.7459	5.69E-14
Residual	14	72.09478972	5.149628		
Total	17	6618.4958			

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