Two Factors Affecting Mobile Payments in China: Number of Smartphone Users in China, Number of Monthly Active WeChat Users

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Abstract. Mobile payment is a mobile client using cell phones and other electronic products to make electronic money payments. Mobile payment combines the Internet, terminal devices, and financial institutions to form a new payment system. Mobile payment has greatly influenced people's life and made a big change in their lives. The primary goal of this study is to find the factors that influence mobile payment. In this paper, we adopt a quantitative research method, and by calculating the annual growth rate and correlation, we conclude that the number of payment users is significantly correlated with the number of active WeChat users and how many people use smartphones in China. The significance of our research is to find the factors that influence mobile payment and promote the usefulness and convenience of mobile payment in our life.

Keywords: Mobile payment · Smartphone users · WeChat users

1 Introduction

The Fig. 1 shows the percentage of various payment methods in China in 2020. According to datahub 2020 statistics, the payment methods in China are: mobile payment, credit card, debit card, cash, and other. Mobile payment accounts for the largest share of 50%.

Mobile payment is the form of the payment that connect the mobile phone and internet to let the consumer more convenient to spend. This paper introduces the factors that influence the number of people using mobile payment: the number of monthly active WeChat users, and the number of smartphone users in China. The important thing about this paper is to study the relationship between the number of mobile payment users in China and the number of smartphone users in China, and the number of monthly active WeChat users. 2019 will see global mobile device shipments reach 3.9 billion and connected devices will reach 7.9 billion. In the Retail 4.0 era, consumers can use the Internet to collect, pay for, and show their life what they want in anytime, anywhere [1]. From 2014 to 2019, mobile payment transactions in China have exceeded 250 trillion yuan [2]. As of mid-2019, more than 30% of mobile payment users in China are under
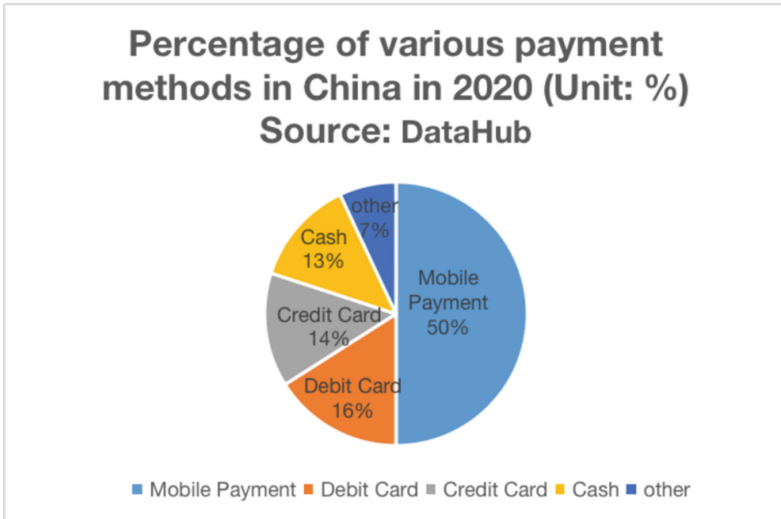
Fig. 1. Percentage of various payment methods in China in 2020 (Self-drawn)

24 years old and 11.2% are over 40 years old. Mobile payment products are gradually gaining popularity. Teenagers and seniors are not the main consumer groups and they use mobile payment more frequently. 62.1% of mobile users are male and 37.9% are female in 2019 [3]. Many articles are currently studying mobile payments in Taiwan, China or North America, so this study aims to fill in the data regarding the research gap in mainland China.

2   Literature Review

With the rapid development of the times, mobile payment has become a hot topic in the current society and has a profound impact on social development. In a related study, the authors investigate how mobile payments affect online and offline business models and how to better integrate these two business models, using cluster analysis and association rules based on a snowflake pattern database design. The role of mobile payments was identified in the context of new retail payment mechanisms [4]. Other studies have also investigated the perceptions and preferences of smartphone users in Korea and the United States regarding mobile payment methods.

The findings were that mobile security was the most influential factor on the frequency of mobile payments in both countries among the three factors of security, cost and convenience [5]. In the first paper, the authors focus on mobile payments in Taiwan, while the other authors choose South Korea and the United States. China has a large mobile payment user base, and the extent and scope of mobile payment use in China is growing. Therefore, this paper focuses on the main factors affecting mobile payments among consumers in mainland China: the number of monthly active WeChat users and the number of smartphone users in China. In terms of research methodology, most articles only use charts and graphs, but this paper will use correlations while using

charts and graphs as an aid to study the relationship between each variable and consumer mobile payments to increase the reliability of the research results. The research in this paper analyzes the future development of mobile payment in China based on the current situation of mobile development in China, which has an enlightening effect on the future of mobile payment in China.

3   Methodology

To analyze the relationship between the number of mobile payments in China and the factors, the methodology used in this study is to do an annual growth rate for each group of factors related to mobile payments in China, which helps us to visualize their trends, and then do a correlation between each group of factors and mobile payments in China. Correlation analysis is the analysis of the signs that do have a connection in the overall, and its main body is the analysis of the signs that have a causal relationship in the overall. It is the process of describing the closeness of the relationship between objective things and expressing it with appropriate statistical indicators, which can visualize the relationship between 2 or more variables. Correlation is mainly used to examine whether there is a relationship between two or more variables, how strong the relationship is, and whether it is a positive or negative correlation. The final calculation can be abbreviated as R. The variables are called X and Y. If X and Y change in the same direction, then X and Y are positively correlated, and if R is greater than 0.95, then the two variables are significantly correlated. If R is greater than 0.8, then these two variables are highly correlated. If R is between 0.5 and 0.8, then they are moderately correlated, and if R is between 0.3 and 0.5, then they are lowly correlated. If R is less than 0.3, the relationship between these two variables is very weak and can be considered as uncorrelated. If x,y change in opposite directions, then the two variables are negatively correlated. The correlation coefficient has the obvious disadvantage that the degree to which it approaches 1 is related to the number n of the data set, which often gives a false impression. This is because when n is small, the correlation coefficient fluctuates more, and for some samples, the absolute value of the correlation coefficient tends to be close to 1; when n is large, the absolute value of the correlation coefficient tends to be smaller. So in some cases, it is not enough to justify with correlations. Moreover, correlation studies only reveal a relationship, but cannot give a decisive reason for the existence of this relationship.

4   Research Design

First, this study finds the number of mobile payment users, monthly active WeChat users and smartphone users in China from 2011–2020 from the iimedia database and Statista database, and then calculates the annual growth rates of the number of mobile payment users, monthly active WeChat users and smartphone users in China, respectively, and then uses their annual growth rates to calculate the correlations between the two groups, respectively are: the correlation between the annual growth rates of the number of mobile payment users and monthly active WeChat users in China, and the correlation between the annual growth rates of the number of mobile payment users and smartphone users in
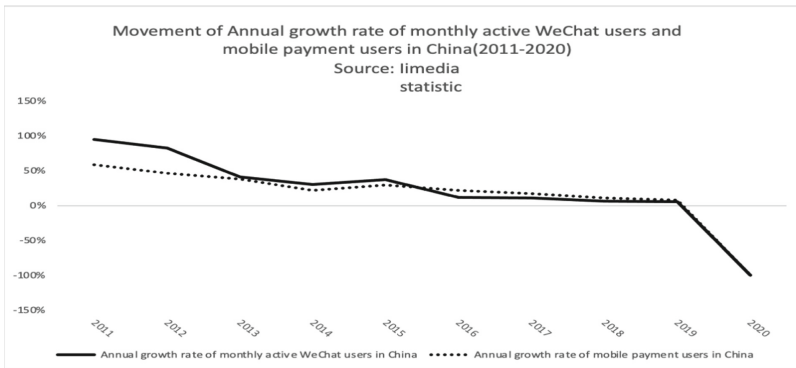
Fig. 2. Movement of Annual growth rate of monthly active WeChat users and mobile payment users in China (Self-drawn)

China. After the comparison, the correlations between the number of mobile payment users, the number of monthly active WeChat users and the number of smartphone users in China are then compared graphically, and then the corresponding charts are made to more visually reflect the trends and relationships between them.

5   Results

The Fig. 2 show the correlation between the number of mobile payment users in China and the number of monthly active WeChat users, also the correlation between the number of mobile payment users in China and the number of smartphone users in China. After all our research, the correlation between the number of mobile payment users in China and the number of monthly active WeChat users is 0.95031417, and the trend is very similar between the two. The correlation between the number of mobile payment users in China and the number of smartphone users in China is 0.98885675, which proves that the number of mobile payment users in China is significantly correlated with the number of monthly active users of WeChat and the number of smartphone users in China, respectively (see Fig. 3).

6   Discussion

This study found that there is a significant correlation between the number of mobile payment users in China, the number of smartphone users in China, and the number of monthly active WeChat users in China, and the increase in the number of smartphone users and monthly active WeChat users in China affects the increase in the number of mobile payment users in China. Research shows that China is the number one mobile payment market in the world. In 2016, it was found that 40% of consumers connected to the Internet in China make mobile payments on a weekly basis and that 77% had at some point in the past used mobile payments. One of the reasons for the high proportion of users in China is the increasing market penetration of smart mobile phones [6].
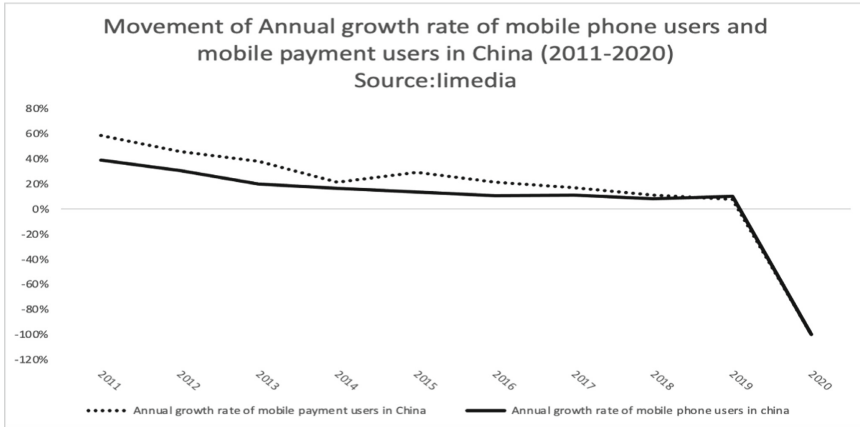
Fig. 3. Movement of Annual growth rate of mobile phone users and mobile payment users in China (Self-drawn)

But at the same time, some studies have found that with broad access, low cost, and reliable transactions, people's daily lives and commercial business models have been changed significantly. The empirical investigation also provides convincing evidence that mobile payment not only promotes household entrepreneurship in China, but also enhance the ability of households to smooth risks when experiencing negative idiosyncratic income growth shocks [7]. Chinese smartphones are equivalent to providing users with a device and WeChat is equivalent to a port for mobile payment, so the two factors affect the number of mobile payments in China to some extent. Studies have found that consumers are increasingly using mobile payment methods for everyday online and on-site shopping, and with the development of advanced technologies that support mobile transactions, making them transparent and convenient, consumers have developed the trust and habit of using mobile payment systems [8]. Nevertheless, although revolutionary financial inclusion has been created, China's new mobile payment business still needs to evolve further to address outstanding issues, including consumer protection, data inequality, and regulatory arbitrage [8].

So while mobile payments necessarily have the advantage of convenience, it also has disadvantages that cannot be ignored: mobile payments can cause market disruption and threaten financial stability, potentially raising new policy issues and new liability questions for the existing regulatory framework. China's current regulatory system of industry segregation and institutional centralization is ill-suited to manage the financial risks of this new business often leading to regulatory loopholes and arbitrage. Regulators should emphasize and strengthen the protection of financial consumers by shifting from an institution-based framework to a function-based regulation, and China should improve consumer financial literacy by regulating the behavior of financial institutions. Other shortcomings are problems caused by differences in life skills: in our daily lives, life can become very inconvenient or even difficult if a person does not know how to use a smartphone or does not have software that allows mobile payments, for example. According to research, in 2020, there are still 4.63 million people do not use internet,

and 48.9% people they do not known what is internet [9]. So policy makers have to find should find ways to facilitate people without smartphones can spend conveniently in a mobile payment-led payment system and reduce the negative impact.

7   Conclusion

The purpose of this paper is to investigate whether and how the number of mobile payment users in China is related to the number of smartphone users and the number of monthly active WeChat users in China. The results of the study also prove that there is a significant relationship between the number of mobile payment users in China and the number of smartphone users and monthly active WeChat users in China. The method used in this study to calculate the annual growth rate and correlation is more scientific than simply using charts to prove the idea that mobile payment in China is influenced by the number of smartphone users and the number of monthly active WeChat users. The significance of studying and developing mobile payments is to improve the convenience of financial services and to better serve customers. It changes settlement methods, improves service efficiency, promotes consumption growth and upgrading, and drives the development of new business models. Dynamic data mining and consumer behavior analysis supported by mobile payment can better grasp the changing needs of consumers and provide personalized and accurate consumption suggestions. However, this study also has limitations: other relevant factors were not studied in the data collection, and the observation points are relatively few, only from 2011 to 2020. Therefore, future studies can add diversity to the factors by examining and comparing changes in factors across regions based on this study. In China, mobile payments are also moving into a new phase as a prominent representative of the new economic approach. The development of mobile payments has driven China's domestic traditional industries from online to offline, the emergence of Internet economic benefits has solved the problem of mobile Internet payment modules, and mobile has driven the integration of mobile-mediated payments. As mobile Internet and mobile payment complement each other, mobile payment has changed people's consumption concept and consumption habits, mobile payment has created more employment opportunities for the real economy and the Internet economy, mobile payment has helped the development of the real economy while bringing more consumption entrances to the real economy, guiding the healthy and sustainable development of the real economy and promoting the development of the Internet economy, Internet finance, the Internet technology, Internet applications and other industries have emerged to provide more room for Internet entrepreneurship, which is beneficial to economic and social development and can stimulate the consumption power of Chinese society. However, the possible negative effects of mobile payment can also be studied in more depth in future research.

References

1. McKinsey & Company. (2019). Global Payments Report 2019: Amid continued growth, accelerating challenges are needed a bold move.
2. Data.iiMedia.cn (2020). Analysis of China's mobile payment industry dynamics and transaction scale in 2019.
3. IiMedia Research Inc. (2018). Scale, user profile and behavior analysis of mobile payment users in China from 2019 to 2020.
4. Liao, S.-H., & Yang, L.-L. (2020, August 1). *Mobile payment and online to offline retail business models.* Journal of Retailing and Consumer Services. Retrieved September 4, 2022, from https://www.sciencedirect.com/science/article/abs/pii/S0969698920307220
5. Shin, S., Lee, W.-jun, & Odom, D. O. (n.d.). Journal of Applied Business Research (JABR). Retrieved September 4, 2022, from https://clutejournals.com/index.php/JABR/article/view/8793
6. Consulting, D. (2022, August 29). *Mobile payments in China: How China became Mobile first.* Daxue Consulting - Market Research China. Retrieved October 20, 2022, from https://daxueconsulting.com/payment-methods-in-china/
7. Bezhovski, Z. (2016). *The future of the mobile payment as electronic payment system - core.* Retrieved September 3, 2022, from https://core.ac.uk/download/pdf/234627158.pdf
8. Huang, Y., Wang, X., & Wang, X. (2020). Mobile payment in China: Practice and its effects. *Asian Economic Papers*, *19*(3), 1–18. https://doi.org/https://doi.org/10.1162/asep_a_00779
9. CNNIC. (2020). Why people do not use internet.