



THE BROOKINGS INSTITUTION | JUNE 2019

Is China's new payment system the future?

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STATEMENT OF INDEPENDENCE

The author did not receive financial support from any firm or person for this article or from any firm or person with a financial or political interest in this article. The author is not currently an officer, director, or board member of any organization with a financial or political interest in this article.

ACKNOWLEDGEMENTS

The author would like to thank the David M. Rubenstein President's Strategic Impact Fund at Brookings for its generous support for this work. Many individuals were particularly helpful in this research and deserve particular thanks, including: Cheng Li, Zizhu Pan, Qi Ye, Jasmine Zhao, Siddhi Doshi, and Amy Hu. Additional thanks to the John L. Thornton China Center and the Brookings-Tsinghua Center for assistance and to Deborah Washington, Greg McGovern, Cayli Baker, Anna Dawson, and others who helped make this project and associated events happen.

Executive Summary

While America spent the past decade upgrading its bank based magnetic striped cards with chips, China experienced a retail payment revolution. Leapfrogging the card-based system, two new payment systems have come to dominate person-to-person, retail, and many business transactions. China's new system is built on digital wallets, QR codes, and runs through their own big tech firms: Alipay running through Alibaba (China's version of Amazon) and WeChat Pay running through Tencent (China's version of Facebook).

China's system largely disintermediates banks from payment transactions robbing banks of an important and long-standing source of revenue. It creates an alternative payment ecosystem with different incentives between merchants, consumers, and payment system providers. It challenges the long-standing placement of payments on the side of banking as opposed to commerce. In doing so, this system creates new incentives that could realign existing business models and relationships between merchants, banks, and technology providers.

China's new payment system exploded in under a decade, growing from inception to dominance. With over a billion users on each platform, the power of network incentives has been unleashed. The new payment system has replaced cards and cash at registers, how families give gifts, and even how beggars ask for money, with QR codes replacing tin cups.

What is the future of this system in China and globally? Will it replace the bankcard-based system that launched in America and took over the world? What does it mean to have a payment system migrate from the banks to tech?

This report goes into substantial detail on these and other important questions. The main findings are:

- China's new payment system is here to stay. It will continue to grow domestically and globally, following Chinese travelers and consumers abroad.
- New technology makes possible the movement of the payment system away from banking and into technology and social networking. Technology and social network firms have other sources of data on which to base financial decisions such as providing credit. Alternative underwriting is likely to follow alternative payments.
- The incentives created by moving the payment system from banking to technology firms are substantial and potentially concerning. The potential for anti-competitive behavior and privacy concerns by tech platforms by using the payment system and data generated from it are real. However, it is not clear whether these concerns can and would be remedied by effective regulation.
- The economics of China's system are beneficial for merchants but bad for Chinese banks, especially in the short-run.
- The Chinese system is unlikely to catch on in America, but may be more viable in other countries with less developed banking systems.
- America's existing system has multiple impediments to the Chinese model, or a similar one, taking over:
 - Wealthier consumers benefit more from substantial rewards linked to the current payment system;

- Merchants may have difficulty transitioning and generating substantial savings from a new system;
- Consumer behavior is sticky;
- Existing regulatory systems provide substantial consumer protection through the bank-based system that may be lost in a non-bank payment system.
- The American legal and regulatory framework is not well prepared should payments move from banking to non-banking.

Introduction

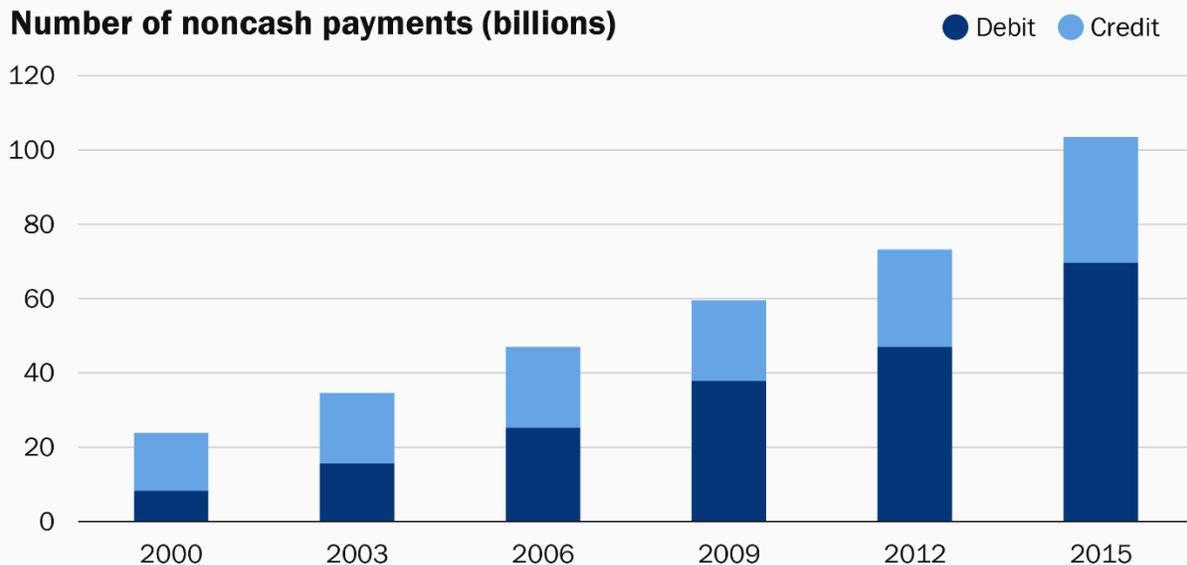
Payment systems are critical components of an economy. The purchase and sale of goods and services requires a method by which transactions can be executed. As modern economies grow more complex and transactions between buyers and sellers more anonymous, fast, reliable, and trustworthy, the importance of payment systems grows. As Federal Reserve Chairman Powell [stated](#):

“An efficient payments system provides the infrastructure needed to transfer money in low-cost and convenient ways. Efficient systems are innovative in improving the quality of services in response to changing technology and changing demand.”

[50 years ago](#), the U.S. led a global revolution with the creation of magnetic striped cards linked to bank accounts and lines of credit. These cards, and the corresponding terminals to read them, allowed a small plastic card to replace cash and checkbooks for billions of consumers and merchants and process trillions of transactions. These cards achieved such ubiquity in the developed western world that most consumers and international travelers take their presence for granted.

They have continued to grow, providing the backbone for e-commerce and new methods of digital payments. New methods to utilize card-based payments accounts have grown. Devices can now turn smartphones into credit card processors (Square) and transactions can be securely transacted on-line (Paypal). However, the underlying payment networks in America remain a bank-based system.

Number of noncash payments (billions)



Source: Federal Reserve Payment Study

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The next global revolution in payments has happened. In the past decade China has experienced an internal payments revolution, leapfrogging magnetic cards, moving to a system based on smartphones and QR codes. But the changes from this system go far beyond just a new technological form. The Chinese payment system has done something far more revolutionary: it has largely disintermediated the banking system.

In America, and most developed economies globally, the payment and banking systems have been intertwined for centuries. The connection between the two is clear: who is better equipped to intermediate payments between counterparties than the financial institutions that hold those parties' funds? Yet new financial technology and the Chinese application have created a viable alternative payments model where banks play a far less central role, and in the extreme, possibly none.

This new payment form requires greater analysis to appreciate the benefits, costs, and implications from a new model. Understanding this model will help answer key questions and inform policy decisions on how America ought to modernize its payment system. Put more concretely, will the American-led invention of magnetic stripes and card readers be globally replaced by digital wallets using QR codes to transfer funds external to the banking system? Will banks continue to play the central role in operating payment systems or will new tech disintermediate banks? If disintermediation occurs, what are the ramifications of combining payments with commerce instead of banking?

Understanding the Chinese System: Starting Points

China seems an unlikely candidate to develop a new payment system. The nation boasts strong banking rates for its citizens, largely as a result of the government's strong role in providing benefits to citizens through the banking system. Many Chinese citizens have at least two bank accounts, as the government provides subsidies for [different benefits](#) through different banks. Additionally, Chinese banks worked collaboratively to create UnionPay, a Chinese based card network.

China has the [largest card network](#) in the world with [7.6 billion cards](#). According to the People's Bank of China, the vast majority—6.9 billion—are debit cards, while only 686 million are credit cards. Protected from foreign competition by the Chinese governments refusal to allow Visa, MasterCard, or American Express, it seemed plausible that UnionPay would develop into the dominant payment system within China, mimicking the card-based system in other large economies.

However, adoption of the card-based terminals among Chinese merchants ran into opposition. First, merchants did not like the fees. The idea of paying even 100 basis points for processing payments met with opposition. Merchants were slow to adopt card readers, reluctant to either absorb the costs or pass them along to customers. Second, card readers require either a wired telephonic system or a wireless system to communicate. Both require merchants to integrate that technology and pay those costs. Again, merchants showed little interest in doing so, which helps explain why there were only just [over 34 million point-of-sale](#) terminals in China at the end of 2018.

Cash remained a dominant method for exchange. However, cash has its drawbacks. In China, the highest circulating note is the 100 Yuan, worth roughly \$15. This is a relatively low value note for the highest in circulation, compared to the \$100 bill in the US and the 500 Euro note. As a result, cash transactions, particularly for higher value goods and services are more cumbersome. It is not uncommon for Chinese stores to have a cash counting machine to facilitating transactions and protect against counterfeit notes.

With merchants resisting cards and challenges with cash, the usage of an alternative system becomes more likely. The strong growth of smartphone adoption created room for an alternative system to develop. Smartphones provide a new network of communication that can compete with card readers that require landlines or wireless internet/VOIP.

The second component of this revolution is the QR code. In the card-based system the customer is not required to be on-line, and the merchant provides the terminal and a connection. The customer then provides the payment instrument (card) and swipes. The adoption of a QR code, much like the bar code before it, allows merchants who are not connected via phone or internet to still access the payment system, as only one party needs to be connected for the transaction. This feature flips the prior card system where merchants were responsible for providing the connection.

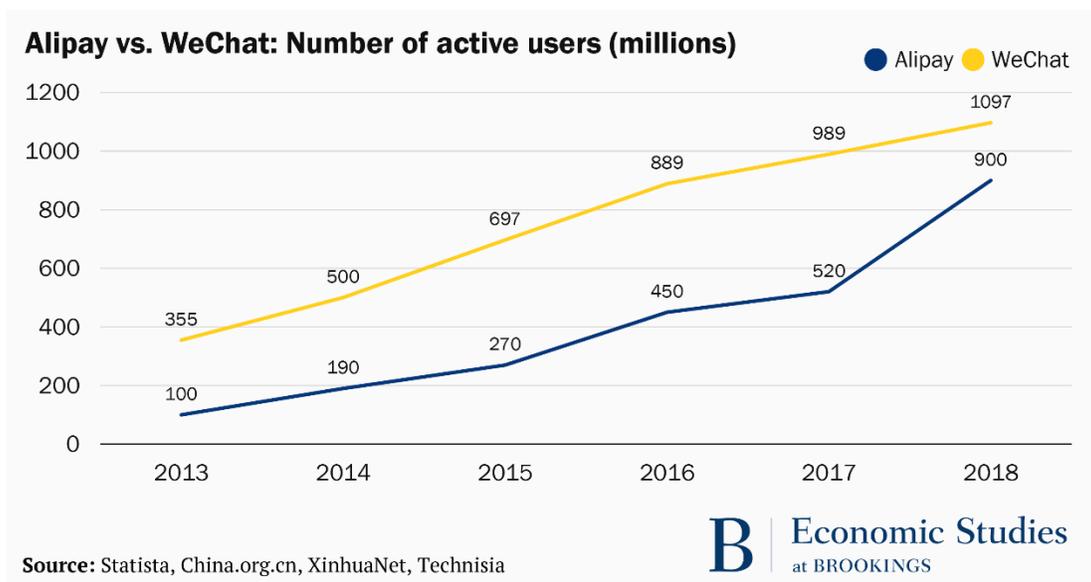
The QR allows for the customer to provide the connection. All the merchant has to produce is a bar code that can be printed on a simple piece of paper. The consumer can leverage the smartphone to both scan the QR code and go-online to process the transaction. This lowers merchant costs even further, particularly for those who do not have easy access to telecommunications. It even allows for person-to-person transactions for folks who have codes but not smartphones. This is even how beggars on the streets are [now asking for](#) and receiving money – tin cups have been replaced with QR codes in China!

Figure 1: QR Codes as means of payment in China



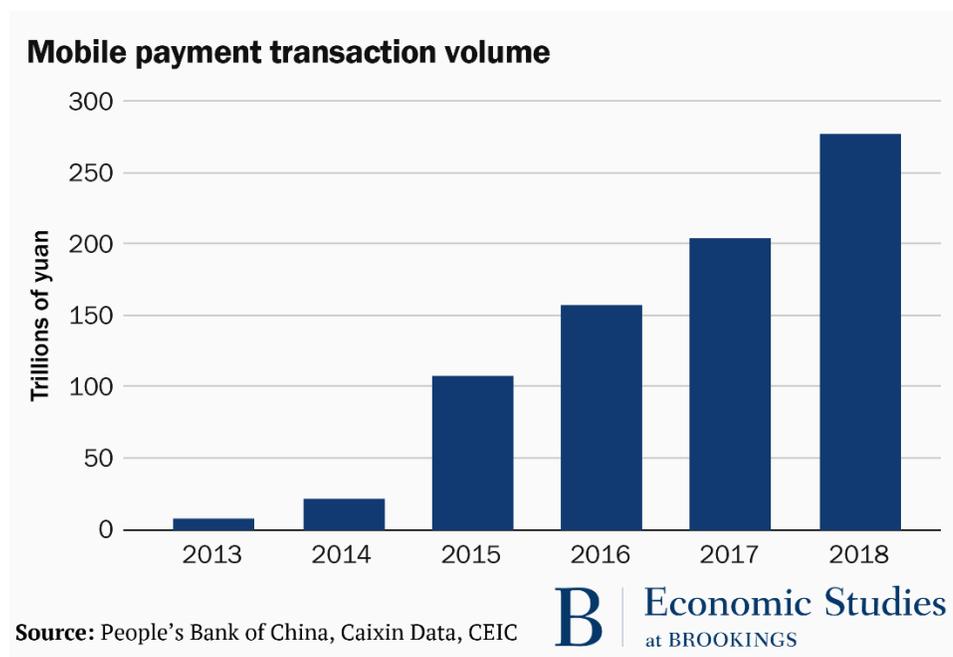
China's Transformation

Given this starting point, the end point is quite stunning. The number of users and growth on both platforms has been substantial and reached near ubiquity in under a decade. Starting from zero at the beginning of the decade, these two payment platforms are now the largest system in China and among the largest in the world.



Alipay has almost caught up to WeChat Pay in active users. Alipay reached [one billion users](#) in 2019 and WeChat Pay surpassed [one billion](#) users in 2018. These two forms of payment dominate the Chinese market. [Over 90 percent](#) of people in China's largest cities use WeChat and Alipay as their primary payment method, with cash second, and card-based debit/credit a distant third.

Mobile payments in China have reached [over \\$41 trillion](#) (277 trillion yuan) annually. More than [92 percent of the mobile payments](#) are made over the two dominant platforms: Alipay (53%) and WeChat Pay (39%). This rise is even more stunning when considering its rapidity.



How Alipay and WeChat Pay work

Alipay and WeChat Pay integrate technologies that are widely available but not commonly used in the United States. Doing so allows each an easy, low cost, method to transmit payment between parties nearly instantly. The technologies are those of a digital wallet and QR codes. Understanding each is necessary for understanding how the system works.

[A digital wallet](#) stores one or more of a consumer's payment credentials electronically and allows consumers to electronically transmit funds in multiple settings. The wallet is generally funded either by transfer from another digital wallet, or directly by linking a bank account and transmitting funds. This concept is different from a digital representation of a credit card, like what is commonly done on [ApplePay](#). A digital wallet stores money, whereas a digital representation of a card simply substitutes the physical card for a virtual one.

There are important distinctions in how wallets are initially funded between Alipay and WeChat Pay, which will be discussed later. For now, assume money in a digital wallet, and that the other side of the transaction has a corresponding digital wallet that can accept or transmit payment.

[QR codes](#) are modern two-dimensional bar codes. With "QR" standing for Quick Response, QR codes are "open source," have a large data capacity, and can serve [multiple uses](#) such as storing contact details or digital payments. Each entity in the Alipay and WeChat ecosystems is assigned a unique QR code. Individuals have them for their accounts, merchants have them for their stores, and even specific payment points such as a parking garage have them

Figure 2: QR codes being used as payment methods



Source: Shutterstock

The payment starts when one party scans the other's QR code. It does not matter if this scanner is the payer or the payee. The scan can be done by one smartphone to another, or by a smartphone to a QR code that is digitally represented or physically printed on a piece of paper. The payer can total the amount due into the transaction for the payee to scan, or the payee can scan the code and insert the amount to be paid. This is analogous to swiping a credit or debit card into a card reader and either accepting the amount shown or entering an amount you want to pay.

One advantage of this system is that the card reading terminal has been cut out completely. The Chinese system works instead directly from account to account via WeChat or Alipay, without a processor in between the two entities. This increases speed (as anyone who has waited for a credit card terminal to process can attest) and reduces cost. It also explains why China has so few point-of-sale terminals and one of the strongest digital payment systems in the world. Cutting out the middleman saves time and money.

The parking garage metaphor

The digital wallets simply transmit the funds between the two parties directly on the platform. Funds remain in each digital wallet. Depending on the transaction, an electronic notification can be embedded that signals a transaction was completed and a bill paid. This creates another moment of integration possible between the payment system and the purchase of goods and services.

Consider a parking garage. The traditional system involves taking a ticket upon entrance, paying the ticket, and presenting the paid ticket upon exit. Some newer garages have tried to improve this system by eliminating the ticket and having the driver use a credit or debit card upon entry, recording that unique card, and having the driver present the same card upon exit. That card is automatically charged the result. Whether the traditional ticket system or the need to remember which card you used in the new system, both are time consuming, costly, and require multiple card reading terminals.

The Chinese system alternative involves scanning a code upon entry, which marks the time you entered the garage. You then scan the code again upon exit, your wallet is automatically charged and the gate opens. This requires wireless communication between smartphones and the parking garage gates. It eliminates multiple card readers, charges for card processing, and time to insert parking tickets and/or credit cards.

The elimination of card swipe costs is particularly important for low dollar, high volume transactions such as municipal garages. If parking is \$2, a debit card processing fee of around 25 cents per transaction would mean that for every 8 cars parking, one of them is paying the payment costs. Credit cards, particularly luxury platinum cards, can have fees closer to 40 or 50 cents on a \$2 transaction, further challenging the economics of the parking system.

The simplest and most common way to get funds onto your digital wallet is to upload them from your bank account. Customers link a bank account and can upload funds instantly from their bank account to either platform. In general, this service is provided at no cost to the consumer. If the sending bank charges a fee, it is usually paid by the digital wallet provider for funds being uploaded; downloaded is a different proposition as will be discussed later.

This is similar to one method to fund PayPal digital wallets, with an important difference in the speed of the service. With a faster payment system than the U.S., China does not require customers to wait multiple days for funds to upload. (For a discussion of the multiple cons of the slow U.S. payment system see [here](#) and the read [how to fix it here.](#))

Prefunding digital wallets is a major similarity between the Chinese system to debit and prepaid cards in the U.S. context. The Chinese wallets generally do not function on a revolving line of credit system and should not be thought of as substitutes for credit cards. Should Ant Financial, the banking arm of the AliBaba/Alipay enterprise wish to provide credit to fund these wallets it can and does (same with WeChat Pay). That is an option for some, although not nearly as common nor on the same terms as American credit cards. Similarly, banks or other lenders could access both platforms and provide credit alternatives to pre-fund the digital wallets. The terms and economics of that are less advantageous because of the lack of fee revenue generated by using the payment platforms as discussed below.

Thus, the simplest model is for users to link bank account(s) to digital wallet(s) and then upload funds as needed. Those funds survive in the eco-system and can be augmented by future uploads or other funds received in transfers from other persons or businesses, with consumer digital wallets more likely to be replenished by personal transfers, and business digital wallets likely to be filled by new revenue.

Digital wallets still require funds to be moved into the banking system for banking purposes. Digital wallets themselves do not pay interest, as they are not interest-bearing bank accounts. For the user to generate interest s/he must move funds into a money market, bank account, or other investment account. Investing requires customers to move funds out of the Alipay/WeChat Pay wallets and back into the banking system. This is commonplace and can be done quite easily through both applications. Of course the products available, and banks able to offer services on those platforms are a function of the relationships and partnerships between the tech platform parents and other institutions.

Originally, the parent company could and did use customer funds for their own purposes to park in overnight funds and earn interest for the business. The Chinese government took [steps to crack down](#) on this, beginning in 2017 with a requirement that 20 percent of customer funds had to be kept in a custodial account at a Chinese bank that did not bear interest. That figure was subsequently raised to 50 percent in 2018 and then to 100 percent beginning in 2019. The result is estimated to transfer \$1 billion in interest being earned by Ali and WeChat back to the banking system. This move was [interpreted](#) as an attempt by the Chinese government to either reign in the mobile payments and/or support Chinese banks.

Origins of WeChat and Alipay

WeChat Pay and AliPay differ in how funds are spent. The difference is largely derived from the origin and purpose of each system. WeChat Pay is based on a social media platform (think Facebook) and is heavily engaged in person-to-person payments. Alipay is rooted in a digital commerce platform (think Amazon) and hence more likely to receive business revenue or be used for business purposes.

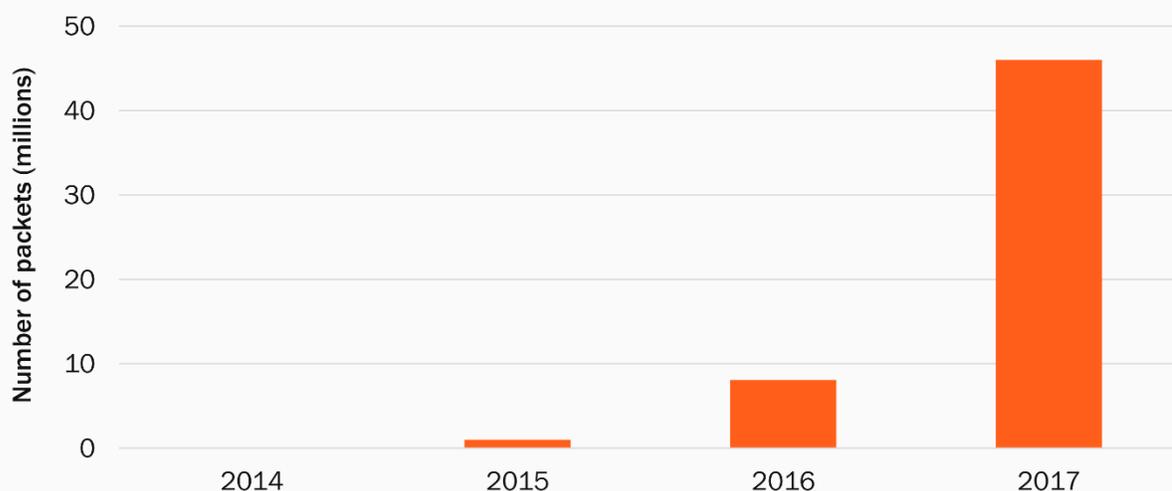
Tencent, WeChat's parent company, wanted to incentivize purchases for online games and ecosystems (think CandyCrush) or other popular in-game purchases. Widespread credit/debit cards linked to game accounts makes this easy. But in 2002, Tencent had a user base that lacked this system, so they created a digital coin: QQ. The QQ coin went viral both as a means of online game payment and as a speculative digital currency. [Estimates](#) were almost \$1 billion of coins trading with an appreciation of over 70% in value.

The process of uploading QQ coins and spending them offline, coupled with speculators sharply influencing the price of the coins, made them ultimately non-viable as a medium of exchange. There are similarities to Bitcoin's inability to gain a foothold for routine payments. However, the experience certainly shaped Tencent's thinking and demonstrated the willingness of Chinese citizens to use digital currency.

WeChat Pay first rolled out as a service to facilitate personal funds in the form of '[Red Envelopes](#)' (or Red Packets) around the Lunar New Year in 2014. It is common in China to give cash on the new year, particularly between parents, children, and other family members. WeChat Pay proposed digitizing this exchange, which given their person to person social media network was clearly synergistic.

The [popularity](#) of Red Envelope exchanges seeded many customers' WeChat Pay accounts with initial funds. WeChat launched the Red Packet digital payment idea in 2014 and 16 million packets were sent. The next year, 1 billion packets were sent. By 2016, it was over 8 billion and in 2017, 46 billion.

Total Red Packets exchanged via WeChat (millions)



Source: The Lowdown

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With QR codes widely available and cheap for merchants to adopt and a large user base funded with Red Packets, WeChat's path to creating an alternative payment platform was clear. What started with consumers then translates to merchants as merchants see their accounts filled when customers purchase goods. As their digital wallets fill, they can use those funds to pay their bills to other businesses, or transfer funds for personal uses. Most small businesses, after all, are closely integrated with personal accounts.

Alipay's origin differs. The lack of a credit card system is a major problem. Internet commerce required electronic payment systems, which were integrated with credit and debit cards. As the Peterson Institute's, Martin Chorzempa illustrated in a detailed analysis, the lack of such a system in China [incentivized](#) Alibaba to develop Alipay such that its Taobao web platform could take off. With UniPay, only having recently launched and not having gained too many customers, the payment market was wide open. Alibaba offers incentives for merchants to use Alipay for purchases throughout their platform. First, is a lack of any fees on such purchases for either party. Second, is the potential preferential placement on digital platforms for both merchants. Third, is the ease of payment integration into business processing. Each provide substantial economic benefits that are not widely available in the bifurcated credit/debit card system. There are

also potential drawbacks of this integrated model, including the lack of fees to provide services customers want with payments – such as interest-free grace periods of credit – and anti-competitive concerns of integrating business platforms and social networks with payment platforms.

The lack of fees is a huge incentive for merchants. Consider a small business that pays over two percent for payment processing fees, which is the [United States average](#) for major cards like Visa, Mastercard, and Discover. Businesses can save two percent of gross sales by using Alipay, provided that revenue is also spent on the platform. Payment processing fees are based off of gross sales, not net revenue, and as a result, the savings potential as a share of profits are far greater. In general, business profits average only [7.5%](#) of total gross revenue. Saving 2% of gross revenue could have an impact closer to 20% of profit margins.

The implications differ based on business size, although it is not clear in which direction. While larger businesses are often able to negotiate lower credit card processing fees, they also typically have smaller net profit margins as a share of gross revenue. Smaller businesses generally pay more for card processing, although new entrants into the marketplace like Square and PayPal are driving down costs. However, small businesses also typically have larger gross margins and depending on the nature of the business may receive fewer payments from cards. Either way, lowering processing fees is a win for merchants.

There is also an important caveat to the zero-fee system: the funds have to be spent on the AliBaba ecosystem. This is because there is a cost to downstream funds back into the banking system. This may have a larger impact for merchants when they receive revenue through Alipay. It now creates a different final cash flow/profit structure depending on whether they received the funds through Alipay and were able to spend it elsewhere in the Ali ecosystem, had to download it to their bank account, received funds through an alternative digital platform (WeChat Pay), debit cards, credit cards, or cash. It is not clear depending on the merchant's business model and payment usage whether the business can effectively use all of the funds on Alipay to purchase the intermediate goods and services it uses within the Ali ecosystem.

This creates incentives for the Ali ecosystem to expand to provide greater services to businesses. It also creates a comparative advantage for pricing within the Ali-ecosystem. This could create competitive disincentives for off-platform business. It is possible that Ali can recapture some (or all) of this value through alternative charges for conducting business on the platform, such as advertising fees.

This second incentive to create further avenues to expand the goods and services available on the same ecosystems as the payment networks is quite different from the American/European system. Banks do not host large platforms for consumers and merchants to purchase goods and services. The payment processing sector of the economy – Visa, MasterCard, Square, Verifone, Venmo, PayPal, etc. – exists to facilitate merchants accessing the payment system to handle the transaction.

The movement of payment processing from banking into the commerce system in China raises a series of economic incentives and competitive forces that are largely absent in the American context. This is not because of America's separation of banking and commerce. That separation does not place payments into the sphere of banking. Banking is generally tied to the [taking of deposits or making of loans](#). While economists appreciate the intellectual equivalency of a bank providing a revolving line of credit that allows consumers 90 days to repay with interest charged, and a service provider offering a similar window with a series of escalating late fees, the legal system defines one as banking and the other as commerce.

Payments have historically existed within banking because banks had the technology, networks, knowledge of customers, and funding structure to most easily provide these services. The Chinese payment revolution is fundamentally changing that equation. Technology, particularly interconnections on social media, scale of digital e-commerce platforms, and adoption of modern bar codes, broadens the capability of new entrants into the system.

The final point is the converse of the earlier: what other non-banking services that use the payment system could potentially become integrated into a Chinese model? One possibility would be payroll processing. Rather than having employers take revenue off the digital payment system into their banks, then transfer to employee banks, only to have the employee then transfer the funds back onto the ecosystem, why not have the ecosystem handle payments directly?

There is little data or reports that payrolls are being met through Alipay and WeChat Pay, at least not in the formal economy. Whether this is happening in the informal economy, is more difficult to research. The lack of payment processing adoption may be due to government or private record keeping systems, tax policy, or habit. Expansion by Alibaba or WeChat into payment processing may be logical extensions, aided by the funds in digital wallets that retailers and employees share. (imagine if Amazon or Facebook offered payroll processing to compete with firms like ADP).

If this expansion were to happen then it may be more likely on WeChat Pay than Alipay. For the merchant, there are broader options to spend funds on Alipay, buying intermediate goods. Given the merchant generally receives sales from both platforms it may be easier for them to use their Alipay funds for business supplies and WeChat for Payroll. Further, WeChat's origin and strength in person-to-person payments (Red Packets) may give it a comparative advantage in payroll.

How to Get Money Out of The Ecosystem, But Why Would You?

The Chinese payment system makes it easy to continually keep funds in digital wallets. The ubiquity of acceptance, lack of fees, and ease of commerce motivate consumers. Money brought into the digital wallet system can be moved into interest-bearing accounts, like money market funds, or invested into Chinese stocks directly through broker-dealer accounts partnered with the platform.

This is particularly the case with Alipay becoming part of Ant Financial. Ant's largest mutual fund, [Tianhong Yu'e Bao](#) has almost 600 million investors, over \$168 billion in funds, and offers short term interest of over 2%, and generally provides a better return than leaving funds in a Chinese bank. The growth of this fund, mirroring the growth of Alipay as a digital wallet, highlights the opportunity to merge digital wallets with broker-dealer accounts directly, further disintermediating the bank deposit relationship.

Businesses have similar motives and opportunities to keep funds in the ecosystem, but greater demands to bring funds out of the ecosystem to make payments using the banking system. Both consumers and businesses need an off ramp and though it exists, it is not designed to be terribly attractive.

Account holders can move funds out of Alipay or WeChat Pay and back into their linked bank account. Alipay imposed a fee of 10 basis points with a minimum, [20,000 yuan](#) (roughly \$3,000) and a minimum of 0.1 yuan for smaller transactions. WeChat charges a similar fee, 10 basis points for all transfers above 1,000 yuan (roughly \$150) into bank accounts. For transfers under 1,000 yuan there is a flat fee of [0.1 yuan](#). While this fee is small relative to American standards – credit card transfer fees are usually in the range of 2-4%, and digital wallet providers like PayPal pass those fees directly on¹ - the fee appears directly to Chinese consumers. This is a stark contrast to the fee-free zone of all payments within the ecosystem. That is by design, as one analyst [describes](#): “The transaction fees will encourage users to make fewer withdrawals and thus keep more money circulating within the WeChat Wallet ecosystem, therefore increasing the opportunities for other spending within it.”

...

¹ PayPal charges 2.9% plus a flat fee of 30 cents, which is not always the actual cost they pay as that differs depending on the type of card, negotiation between PayPal and the bank sponsoring the card, etc. More information about PayPal fees can be found here: <https://www.paypal.com/en/webapps/mpp/paypal-fees>

Credit is a Bit Different

These fees are assessed when funds are moved out of the digital wallet and online platforms associated with each provider, back into the banking system. There is a much smaller but growing provision of credit through the Alipay and WeChat Pay system as well. As mentioned earlier, China is still a heavily debit, prefunded system with relatively little penetration of credit cards to fund purchases.

Ant and Tencent are both entering the credit space. Unlike the well-developed and widely-used credit scoring systems ([the accuracy of which](#) is another matter) in the U.S. and Europe, China has less in the way of credit scoring. Much has been made of Ali, WeChat, and others using a social credit scoring system: incorporating factors such as how well-reviewed their business is or the strength of a persons' social network. It is natural for technology and social media firms to focus on data they have, especially proprietarily. Abstractly is it any more or less accurate to predict the future cash flows of a business on past bill payments or current Yelp reviews?

The credit-based system in the U.S. relies heavily on interchange (swipe) fees to fund the provision of services like interest free grace periods, reward points, account costs, collections, etc. The lack of fees generated by the Chinese payment system is a significant barrier to the adoption of a similar system. As opposed to debit cards, credit cards typically offer customers interest-free grace periods between the purchase of goods and payment of the card, provided the customer is paying the bill in full and on time. This interest-free grace period provides value to the consumer and a cost to the credit provider. Rewards points are essentially (and sometimes directly) money transfers meant to entice consumers to use the card particularly for a payment. These costs are more than offset by the charge of [swipe fees](#) as discussed above. This creates the economic environment for the provision of credit cards to consumers who never use the credit feature but are profitable customers for the bank originating the card.

The lack of fees in the Chinese payment system makes the economics of this far more challenging and likely impossible without the creation of an alternative revenue stream (perhaps with data or selling preferred access to the platform).

Devoid of an interchange fee, the Chinese credit card system is starting to directly charge consumers, with Ant financial [imposing a 10 basis point monthly fee](#) on Alipay credit users who charge more than 2,000 yuan (\$300) a month. Passing the cost directly on to customers decreases incentives to use credit. It is an interesting development that runs counter to the American system where the wealthier a consumer is, the lower their costs are to use and access funds.

Costs of the system, who pays what

A central element of this system is that transactions between parties on the same platform are free. That is, the sending and receiving of funds occur without a charge by the platform. This is not the same as if the transactions were costless. With all transactions there is some cost, however small, in building, maintaining, and operating the platform, a non-zero cost in digital transfers, and some cost for an error resolution system. Most of these costs are relatively fixed; that is marginal transactions have very little cost, and the more transactions in the system, the lower the average cost per transaction. However, the costs of operating the system are run by the platform and hence from the user's perspective both consumers and businesses can experience costless payments and instant settlement.

In addition to direct costs, there are also opportunity costs. Generally speaking funds left in the main digital wallet on either platform are not interest bearing. Thus, the holders of the account are losing possible interest. Recognizing this, the platforms, particularly Alipay, have built in partner operations that provide interest-bearing accounts. Alipay in particular has developed a robust eco-system of financial services applications including money market funds and stock brokerage accounts for consumers and lending operations [for small businesses](#).

For an American consumer audience, the nearest parallel would be to consider the range of services that a combined bank and broker-dealer could offer its customers. There is a checking account, often with no interest but immediate access, a savings account that pays interest, a money market account that pays more interest, but either has a higher minimum threshold or some limit on liquidity, and then a brokerage account that keeps stocks, bonds, and possibly a different cash balance that itself is invested in a money market fund, sometimes on an overnight (nightly sweep) basis. In the Chinese context, Alipay and Ant Financial are offering all of these. WeChat Pay and Tencent, along with affiliates can offer a similar range of services.

Importantly, in the Chinese context the payment provider has access to a broader set of information regarding customers' financial life. For example, a regular bank probably does not know the exact relationship of everyone who sends you a birthday gift but does know the amount and name of the sender if sent by a check. By merging the social media network of WeChat with the Red Envelope funds transfer, WeChat does. For example, if you are a younger adult who is lucky enough to receive regular or even sporadic support from your parents, grandparents, or other extended family, WeChat is able to see into your network both socially and financially.

This has ramifications for a host of financial services possibilities. The ability to lend against expected gift income becomes far more possible, as does a potential notification system of financial stress. Corresponding privacy concerns arise, as do questions regarding liability should such future gifts not follow historical patterns. The point here is not to go into depth on the pros and cons of possible financial innovations or their resulting problems, but rather to point out that combining information regarding social connectivity and financial flows between people and businesses, opens up a new range of possibilities.

For small businesses, a similar but broader set of options is also available. The ability to lend against payment flows is greatly enhanced under the Chinese model. Alipay has already provided millions of loans to small businesses, with more than half going to business owners who are under the age of 30, according to the [United Nations High-level Panel on Digital Cooperation](#). This has a direct comparison with the United States where certain payment processors, such as [Square](#), have begun directly lending to small businesses on the basis of cash flow conducted through payment processing.

Banks and payments: A match made in history?

Payment systems are network economies. Ubiquity allows consumers to be certain that sellers will accept their form of payment. Sellers similarly value ubiquity. Both parties require trust. Trust that the method of payment will work, trust that the value being transacted will remain throughout the transaction, and trust that in case of error there are steps to respond.

These are many reasons why payments have historically been integrated into the banking system. Banks are chartered entities provided special authority and support by the central government to handle and cre-

ate money. Banks store money for their customers, consumers, and businesses—a central role for any payment provider. Given that banks serve these roles, providing payment services is a logical extension of the banking business model.

Banks are highly trusted third-party intermediaries. Chartered and highly regulated, banks enjoy strong status and trust among counterparties, which is [core to the business model of banking](#). Consumers must trust that their deposits are available while banks must trust their borrowers to repay funds.

Additionally, banks are ubiquitous as most customers and businesses have a bank account. Banks are also highly networked given their requirements to interact with each other for non-retail payments. Central banks often serve as required networks, another reason why central banks often operate their own payment systems.

Even when payment systems form outside the banking system, they quickly integrate. Despite some popular misconceptions, Visa is a technology and payments firm, not a bank (American Express, however became a bank during the financial crisis). Visa issues cards and provides the technological platform, but the actual cards are bank sponsored.

America has separated the business of banking from general commerce. Banks, from the top of their corporate structure (a bank or financial holding company) are generally prohibited from owning or operating a commercial enterprise. This is not the case in many other countries, notably Japan where companies like Mitsubishi are major banks and commercial enterprises. American banks are major players in the payment space, as that is one area where they can and do operate.

Interestingly, the provision of payments is something a commercial company can provide without providing banking services. The restrictions put in place by the separation of banking and commerce mostly define banking in terms of providing deposit accounts, making loans, and being a chartered bank. Historically, as banks were central in the business of payments, the American system has subtly assumed payments were on the banking side of the separation of banking and commerce, when that does not have to be the case.

Most of the consumer protection laws protecting payments are tied into the banking system. This made sense when these laws were passed, as banks were the providers of most payment services and were already highly regulated. Enforcement from both the government and private litigation were readily apparent as banks are not fly-by-night operations.

Enter the Chinese system. The Chinese payment system has developed to rely very little on the Chinese banking system. This caught banks relatively flatfooted as their own payment initiatives around the traditional magnetic striped card, Union Pay, have struggled to keep up. It also caught Chinese government officials and regulators somewhat by surprise (according to author's conversations with various players in the ecosystem). Major reasons for adoption were ubiquity of smartphones, ease of transactions, and distaste for fees.

Adoption in the U.S.

The natural first question is whether the Chinese system could take off in the United States, similar to how the American-led magnetic stripe system took off globally. The answer is likely no. There are multiple factors as to why this system would be unlikely to catch on broadly in the U.S. But an important corollary

question is whether a payment system that dis-intermediates banks could take off in the U.S. given America's long-standing legal separation between banking and commerce. The answer to this question is yes and has profound implications.

WeChat and Alipay are accepted in America today. They cater mostly to travelling Chinese citizens, including businesses and tourists, but also to the large number of transnational persons who work and live in both countries and continue to exist financially in both ecosystems. There are [2.3 million](#) Chinese immigrants in the United States and [3 million](#) persons who visit on an annual basis.

Acceptance is more common, and likely to grow, in places like New York, Los Angeles, and San Francisco, but also in areas that attract large numbers of foreign tourists like Las Vegas and Orlando (especially Disneyland). Further multinational companies that cater to Chinese tourism will likely add these payment forms to their existing platforms. This explains why Pier 39 in San Francisco and Guess Jeans are [among the American retailers](#) that are already accepting Alipay.

Global companies, like Royal Caribbean International (RCI), are quickly adopting Chinese mobile payments not only on their China-based specific ships but throughout their fleet. RCI began integrating Alipay on Quantum of the Seas, [a ship](#) “designed with our Chinese guests in mind” that sails directly out of Mainland China but has now expanded to accept WeChat Pay and is currently piloting Union Pay mobile QuickPass. Launching in 2018, RCI has experienced over \$10 million in sales on the platforms.² As Royal Caribbean Senior Manager Frank Tuscano puts it: “Widespread digital wallet adoption in China was the catalyst for Royal Caribbean’s latest innovation providing mobile payment services for guests that has significantly increased the velocity of commerce onboard China-based cruise ships. Guests are delighted to have a familiar, frictionless mobile payment experience at sea.”

The list of major American companies accepting Alipay is not confined to those with large Chinese tourists or high-income customers. Walgreens is partnering with Ant Financial and is in the [process of allowing Alipay](#) to be used at 7,000 of its American stores. At first glance, Walgreens fits neither of the above predictions predicated on large tourists, or high dollar customer transactions. However, Walgreens is an active participant on Alibaba’s online marketplace, giving it a brand presence in China and making it a likely recipient of Chinese payments. In addition to Walgreens, Boots brand, popular in the UK and part of the conglomerate, is launching on the platform, selling beauty products and supplements. Walgreens also [owns 40% of the GuoDa](#) pharmacy chain in China.

The incentives for American companies to integrate into the Chinese payment system grow as their retail and online presence in China grows. This makes sense given the economic advantages offered by the Chinese payment firms for businesses that do business over their platforms. Thus, it is likely that as multinational American stores across the chain of targeted income and foreign tourists, expand their business in China they will also expand acceptance of Chinese payments in the U.S. However, it is unlikely that American consumers will make the switch.

Why Americans are not likely to drop their cards for WeChat and Alipay wallets.

America is unlikely to more widely adopt these payment forms as alternatives in large part because our current system works well for the wealthy. Ironically, the driving economic reason why this platform is unappealing to upper income U.S. consumers is the same reason why it took off in China: low fees.

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² Data provided to the author.

The existing American payment system charges high fees and shares those fees between payment system providers (both banks and non-banks) and consumers. These fees, often called swipe fees, include a minimum amount (between 20 and 40 cents) plus an average 2 percent of the transaction. But they can range as high as 4 percent on deluxe credit cards. In total, swipe fees generate [about \\$80 billion a year](#).

The system is [deeply regressive](#). Higher income consumers are offered more deluxe cards. Those cards carry greater swipe fees and also generate more rewards. Further because the rewards from the payment system are considered rebates and not income, they are passed to consumers on a tax-free basis. Thus, the pre-tax value of these rewards is even greater. For the typical high-end American who charges \$80,000 a year on a deluxe credit card that provides 1.5% cash back, that is worth \$1,200 of pre-tax income, or roughly \$2,000 of post-tax income.

Given the low to zero fee environment offered in the Alipay/WeChat Pay system there are simply not enough funds available to make an offer to these consumers that would entice them to give up their platinum or sapphire card. Merchants are [generally unable, either](#) through contract, or unwilling through culture, to offer differential pricing on cash vs. credit. There are legal prohibitions to providing surcharges for using cards and while cash discounts are possible, they are not prevalent (outside of gas stations the only store where price is advertised to the tenth of a cent on large signs).

The recent Supreme Court decision in [Ohio v. American Express](#) restricts merchants who accept one form of a credit card from denying other versions of that card, even if those versions have higher fees. The result of that decision is likely to be continued growth of high-end rewards cards, which further entice wealthier consumers, deepening the [regressivity of the payment system](#). Consumers see that growth in the continued offering of [higher](#) elite credit cards, with greater rewards.

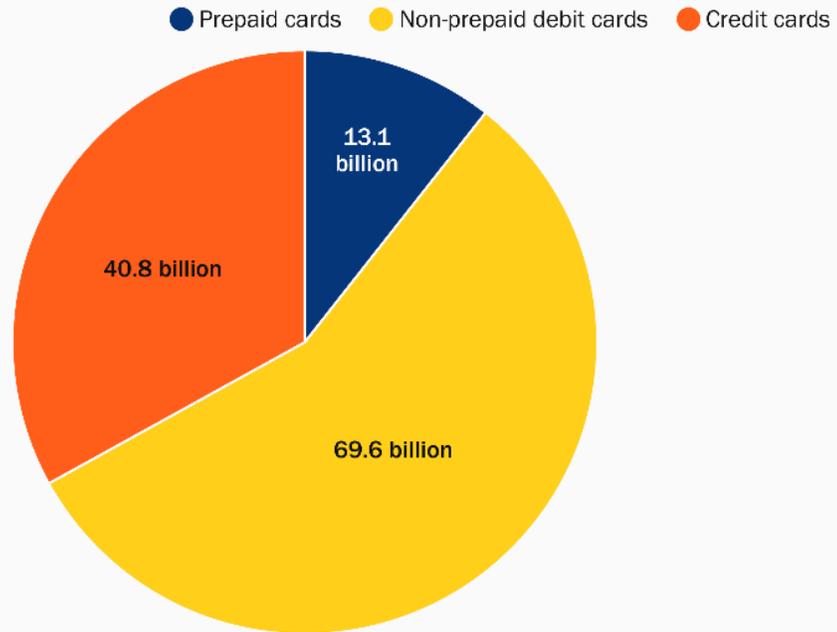
Further, aspects of the value proposition of Chinese payments are lost on high-end American consumers. Rather than valuing the real-time settlement these systems provide, Americans who do not carry a balance on their credit cards enjoy 30-day interest free grace periods. The platform capability to integrate payment and social networking on WeChat and payment and on-line purchasing on Alipay are lost as Americans are on Facebook, Instagram, Amazon, and E-bay.

If higher-end consumers are a lost cause, what about competing for middle- and lower-income consumers? Even if the platform capabilities are lost, the value of real-time settlement is there. One cannot overdraft these systems, a feature of the U.S. debit card system that costs American consumers \$35 billion a year in fees. Going down the income/payment spectrum leads to prepaid cards.

Payment forms in the U.S. are highly correlated with income. [Growing income inequality](#) has meant a larger group of people who rely on alternative forms of payment. The explosion in prepaid cards has targeted this group and gone largely unnoticed by wealthier Americans and for too long policy makers.

Prepaid cards, designed to look like credit and debit cards, [started](#) in the 1990s and grew substantially. In 2017 there were over [13 billion](#) prepaid card transactions. This compares to just under 70 billion debit card transactions and just over 40 billion credit cards. Put another way, more than 1 out of every 10 swipes at the register in America are made with a debit card.

Total number of transactions, 2017

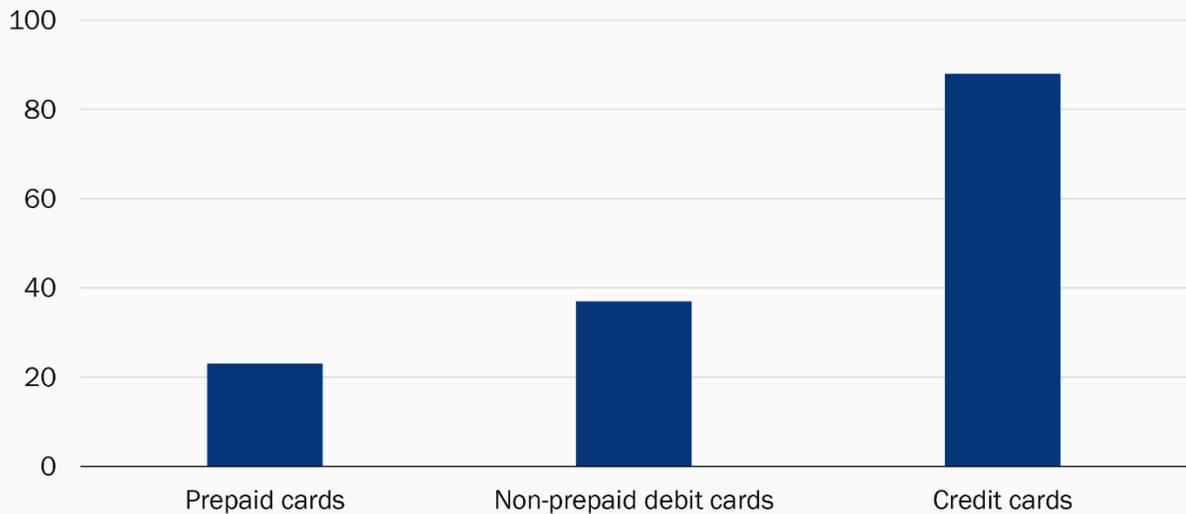


Source: Board of Governors of the Federal Reserve System

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Consistent with the strong correlation between income and payment form, the [average dollar value](#) of a prepaid card transaction is \$23, compared with \$37 for a debit and \$88 for a credit card.

Average value of card transaction (\$)



Source: Board of Governors of the Federal Reserve System

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These cards largely escaped regulation as the existing system was set up under the premise of holding a bank account (debit) or a revolving loan (credit). This was remedied in several steps. First, Congress passed the Credit Card Accountability Responsibility and Disclosure Act ([CARD Act](#)) in 2009, designed to protect consumers from deceptive practices by credit card issuers. Among other things, it included protection from rate hikes, enhanced information disclosure, strengthened protections for consumers under the age of 21, and limited gift card and prepaid card provisions. Second, the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 established the Consumer Financial Protection Bureau (CFPB) and expanded the CFPB's regulatory authority in this space. The result was a [prepaid card rule](#) by the Bureau in 2017 that gave prepaid accounts important protections, under the Electronic Funds Transfer Act (EFTA), a system largely modeled on the regulatory regime debit cards operate under. These protections included extension of debit card fraud protections to prepaid card holders, implementation of a uniform fee to avoid hidden fees, information disclosure, and free access to basic account information.

Importantly, the Bureau's original [prepaid card rule](#) also extended to digital wallets, like PayPal and Venmo. If Alipay or WeChat Pay were to take off in the U.S. they would likely face the same regulatory system as existing prepaid cards

Prepaid cards took off in the United States in part because the cards operated on the same payment rails as credit/debit cards. This meant that merchants did not need to add new accounts; existing payment processing companies were willing and able to integrate prepaid onto the system. For WeChat or Alipay to significantly compete in this space, they would face some resistance from merchants if funds received through these mechanisms had to stay in that ecosystem. If combined costs to process transactions and move funds back into the banking system were higher than the existing system, they would have little incentive. If fees were lower, which given swipe fees for prepaid and existing costs to transfer funds, is possible, then perhaps an argument could be made. Still merchants would likely want to see some level of consumer usage before signing up. This would require both companies to make an aggressive marketing move to these markets, neither of which has.

That is why even though [both WeChat](#) and Alipay have [begun accepting](#) international credit cards to fund digital wallets, a move that could be interpreted as seeking to expand to an international user base, this is not likely the case. Linking with international credit cards, as opposed to debit, targets higher income individuals, who in the U.S. are less interested in making the switch for their domestic purchases. It does comport with targeting international travelers. The targeting of this appears to aim more for Chinese citizens living abroad and frequent international visitors to China, than to expand in the domestic market, which is logical for the retail payment aspect of the service. In fact, WeChat appears to have a "particular focus on those companies that specialize in high-end or designer products" as it expands into the Italian market.

One final potential market to explore is person to person (P2P) transfers. This market in the U.S. has attracted substantial attention from domestic financial technology firms and social networking companies. Facebook's purchase and integration of Venmo comes to mind, but other payment processors like Square have rolled out P2P transfer functions based on moving funds between bank accounts, while PayPal has integrated digital wallets, bank accounts, and credit cards, into one platform for consumers to choose for P2P, P2B, and B2B transactions.

In China, WeChat started with inter-family gifts of cash, Red Packets. In the U.S. most families exchange gifts, not cash. This is an important cultural difference. While economists have argued that cash is a more efficient method of gifting and [leads to higher utility](#), the practice of gifting cash has been negatively perceived, as one episode of Seinfeld [famously demonstrated](#).

However, the United States does have a substantially large exchange of gift cards, an interesting hybrid between cash and gift. Gift card exchanges are popular, not just within families, but broader social networks such as co-workers, volunteer groups, etc. The most common gift card exchanged is likely the Starbucks Card. [Estimates](#) are that 1 out of 7 Americans receives a Starbucks gift card during the December ‘holiday season’. Overall gift cards in the U.S. were [estimated](#) at \$160 billion in 2018, an increase of 60% from 2011.

The impediments to using either Chinese system for gift card exchange start with the core problem that few Americans are on already on either system. Further, without broad acceptance, it would seem unlikely to catch on. Put another way, the fact that so many Chinese citizens were already on both systems before they integrated payment applications is a key reason why payments were so popular and easy to add. In this way one could imagine Amazon and Facebook being able to start and compete in this market, similar to Alipay and WeChat Pay. But it is very difficult to imagine people signing up to the Chinese services to give money to Americans who may not already be on the system and may not know where or how they could spend it.

A final argument against American adoption is general uncertainty about the ability to access funds stored in digital wallets by Chinese companies. The ability to continually operate these systems with international cards depends on the rules put in place by these companies. Possible capital controls in China or changes in legal or regulatory structure will incentivize international travelers to more closely monitor balances. Additionally, restrictions against opening interest-bearing accounts for non-Chinese customers makes these digital wallets more akin to prepaid cards than debit or credit. Ease, cost, and possible uncertainty about the ability to return funds back into the American financial system will likely reduce adoption.

Chinese Payments Globally

If the American card-based system came to dominate retail payments in the developed and in the non-cash developing world, will China’s new system replace it abroad, if not in the U.S.? In the developed world, the answer is likely no. China’s system will find a place, but it will be challenging for it to supplant it. In the developing world the answer is not as clear and may depend on the actions taken by Chinese companies.

Starting with the developing countries: Europe, the United Kingdom, Japan, South Korea, Singapore, and other highly developed economies remain with bank-focused payment systems. While the usage of cards, in physical or digital form, vary they share the common structure of the United States system: banks sending and receiving the funds on both ends with various payment processors in-between. A widespread transition by retail and merchants to the Chinese system is unlikely for any of these countries, for reasons similar and different than in the U.S.

The prevalence of adoption, familiarity, and sunk costs of the existing payment system serve as impediments to a large change in these developed countries. While some of these countries have different rules and structures regarding payment fees, including a higher incidence of passing along payment surcharges for card fees, by and large merchants and banks have reached an equilibrium of acceptance and partnership.

National differences in payment methods can be sticky and hard to explain. As [Silva et. al](#) (2015) found in a cross-national comparison within the EU of national check usage: “socio-demographic characteristics of consumers can have an important role in improving the results of measures adopted by authorities or in slowing them.” In particular, the study found that younger and higher educated consumers are more likely to replace checks, although legal factors and fees were also important factors.

Another key component is the prevalence, or lack, of mobile wallets. For example, Singapore, a country with a reputation for early adoption of technology particularly financial, is reported to have one of the [lowest adoption rates](#) of mobile wallets and highest loyalties to credit cards. Countries where mobile wallet adoption rates are high, or where mobile wallet providers are hoping to make that the case, will be more likely to see greater adoption. This is happening in some European countries, where a partnership was [just launched](#) between six digital wallet providers in ten countries and Alipay. However, these six mobile wallet providers together have only five million users combined, a far cry from the one billion on Alipay alone. Interestingly, the harmonization of this platform [focuses on QR code compatibility](#), a reminder that the future battle field for payment platforms may well be on QR codes, not on fees for using bank-built payment rails.

Most have real-time payments, which improve the quality and value proposition for consumers, particularly lower-income consumers who need to more closely align their expenditures with their income. This important, but often overlooked difference between Europe, the UK, Japan and other nations adds to the value of their existing debit system as compared to the U.S. where overdraft charges cost lower-income consumers tens of billions annually.

In addition, some of the economic advantages of the Alipay and WeChat Pay systems are predicated on businesses and consumers transacting more heavily throughout those ecosystems. Without large-scale adoption of those platforms more generally, the value proposition of just their payment system is lower for businesses, consumers, and for the Chinese payment systems.

However, the Chinese payment system revolution will still impact these countries. The impact will differ between other countries and the U.S. The first difference is how quickly and widespread some merchants will begin to provide Chinese payment alternatives. The simplest prediction from this research is that where Chinese travelers and multinationals are a large enough share of business, payment alternatives should follow. The [most popular destinations](#) for Chinese travelers are: Japan, Thailand, South Korea, the United States, and Singapore.³

Figure 3: Alipay and WeChat Pay accepted as a form of payment in Japan



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³ This excludes Hong Kong and Macao which are special administrative regions.

Retail businesses that deal with large numbers of Chinese customers should be among the first to adopt these payment forms. Indeed, this is already the case in many of these nations. This trend has already been in place as [one study found](#), “77% of Chinese tourists spent more via mobile payments on their most recent overseas trip than on previous trips over the past two years.”

Other differences will result in how quickly banks in these countries form partnerships with the Chinese payment providers and their affiliated banks. In South Korea, Tencent was able to [execute a partnership](#) with Woori Bank in 2015 to provide payment services for WeChat Pay. The economics of this transaction relied on foreign exchange fees between the Chinese customer and the South Korean merchant, a system that is more like the credit card model previously employed.

Interestingly, when a Korean company, KakaoPay, began to [implement a similar](#) mobile wallet-QR code system for retail payments, executives from Tencent did not view it as a competitor. This was because Tencent was not aiming to expand into Korean customers, instead [WeChat said they](#) were “targeting only Chinese people.”

On the other side, government in South Korea is trying to use the ability to serve the 6 million annual Chinese visitors to South Korea as an incentive to promote their own low-cost payment network. ZeroPay, launched to try to help small businesses lower payment costs, has recently [signed a deal](#) to serve both Alipay and WeChat Pay and is also based on the digital wallet/QR code system.

Partnerships are not limited to the developed world. WeChat has [partnered](#) with Standard Bank to allow customers to withdraw WeChat amounts at ATMs in South Africa. Both Alipay and WeChat Pay are accepted in [over 40 countries](#) globally.

Conclusion

China’s payment system has evolved into a framework based on non-bank payment platforms and QR codes. It stands in sharp contrast to the Western, bank centric, card-based model.

Absent a substantial shock, China is likely to remain on this alternative platform. Businesses serving Chinese retail customers will likely have to adopt Chinese payment platforms. Possible partnerships between western financial institutions and Alipay and WeChat may make that transition easier. Or transaction costs and frictions may remain, creating impediments for non-Chinese firms to accept Chinese payment systems. Those developments will impact the marginal penetration of Chinese payment systems. The overall outcome seems clear: Chinese payment systems will be integrated into global payments.

However, Americans are unlikely to abandon their cards for Chinese payment platforms. First, Chinese companies and the Chinese government are not pursuing that. Policy restrictions, particularly the inability to link non-Chinese bank accounts to the payment systems have made it more difficult for foreigners to enter the payment ecosystem. Second, wealthier American consumers are economically better off with their current rewards credit card systems and will be difficult to pry away. To the extent that a market opportunity exists it is with lower-income users of prepaid or debit cards. However, the economics of that business and that customer segment do not appear on the radar screens of China’s payment operators.

American payment providers, both banks and non-banks, may learn and apply lessons from the evolution of the Chinese system. The adoption of QR codes, integration of smartphone scans, and sensor/phone-based payment systems offer substantial advantages over the existing card/chip/pin/sign device-based system. These advantages exist regardless of whether the payment is processed through the banking or non-banking systems.

Merchants eager to reduce processing costs may use some of these alternative systems to try to induce American customers to use lower-cost payment methods. The economic space to try that will grow if higher-cost payment options like ultra-reward cards grow. However, the fixed costs of adoption of new payment technology and the powerful forces of consumer habit remain as substantial barriers. Americans after all were a [lot slower to adopt text](#) as compared to phone calls compared to others around the world.

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