

Chapter 1

The Fintech Marketplace

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§ 1:1 Introduction

A fast, efficient, secure, accurate, and widely available payment system is necessary for a modern economy. Consumers and businesses require a payment system that will process transactions between them quickly, safely, and accurately. Trust in the system is of utmost importance. Recourse in case of error, protection against fraud, and availability of funds are also important components of a state of the art payment system.

America's payment system is rapidly evolving. Just over one hundred years ago America lacked a central bank. Fifty

years ago, cash and checks dominated the market place. Twenty-five years ago, credit cards and electronic transactions were still finding their footing. Today, mobile payments are transforming the way that businesses and consumers do business. Over the next decade new technology could revolutionize the way that money flows between businesses and consumers. Evolving payment systems and financial technology will be at the center of this potential revolution.

This chapter will begin with a brief overview of the history of the U.S. payment system. It will provide general background on traditional payment providers such as banks and money transmitters, as well as describing different systems of payment. The chapter will discuss some of the new non-traditional entrants into the payment system. It will describe some of the new types of payment services they are offering consumers and businesses.

§ 1:2 History of the U.S. payment system

America spent the majority of the 19th century without a central bank. Consumers would use bank notes, whether in the form of paper or as a check, to draw funds. Businesses would accept those notes and checks and deposit them at other banks. Inter-bank clearinghouses were formed to facilitate this highly fragmented system. The largest of these, simply called The Clearing House was formed in 1853 in New York City by many of the largest banks at the time.¹ The Clearing House still exists, and functions as a major payment and clearing services for its members.

The U.S. payment system experienced a severe disruption during the banking panic of 1907. During this panic banks became unsure of the solvency of their counterparty banks and began to refuse settlement and clearance of payments from other banks. This refusal to clear funds led to the destabilization of banks and worsened the panic. The panic of 1907 led to a severe recession, in which economic output is estimated to have fallen by 12%.² As a result of the severity of the crises and to fix flaws in the payment and financial

[Section 1:2]

¹<https://www.theclearinghouse.org/about-tch/a-look-back>.

²Tallman, Ellis, The Panic of 1907, Federal Reserve Bank of Cleveland Working Paper 12-28, 2012 (<http://www.clevelandfed.org/research/workpaper/2012/wp1228.pdf>).

systems, Congress created America's third central bank in 1913, The Federal Reserve System (the Fed).³

The Federal Reserve was given the authority to create a national check-clearing system. The Fed's check clearing system was never a monopoly. It competed with private systems, such as the Clearing House, in providing payment and settlement services for banks. The existence of this competition is intriguing as during the middle of the century the Fed provided check clearing free of charge to its member banks.⁴ Competition continued to exist for a variety of reasons, including the desire of some banks to remain non-Fed members, auxiliary services provided by competing clearing houses, and increased speed offered by local clearinghouses.⁵ This highlights that cost of service is only one element of the payment system. Speed, reliability, the presence of auxiliary services and benefits, and regulatory concerns are all elements of the choice of what payment system to use.

Over time, Congress expanded the authority of the Federal Reserve's system to allow more banks and depository institutions access to the system, as well as enhancing the Federal Reserve's authority to regulate the system. Important legislation authorizing the Federal Reserve's role in the payment system includes:

- The Monetary Control Act of 1980, which required the Fed to offer its services at cost;⁶
- The Expedited Funds Availability Act of 1987 which expanded the Fed's regulatory authority to the payment system in general;⁷
- The Check Clearing for the 21st Century Act of 2002, which eliminated the requirement for presentation of the original, physical check, allowing for a new wave of financial innovation;⁸ and
- The Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (Dodd-Frank) which enhanced

³http://www.federalreserve.gov/pf/pdf/pf_7.pdf.

⁴http://www.philadelphiafed.org/publications/speeches/santomero/2005/09-10-05_pacb-128th-annual.cfm.

⁵http://www.philadelphiafed.org/publications/speeches/santomero/2005/09-10-05_pacb-128th-annual.cfm.

⁶PL 96-221.

⁷Title 12, Chapter 41.

⁸PL 108-100.

the Fed's authority to regulate the payment system including regulating financial market utilities.

The Federal Reserve serves a dual role as both a provider of payment services and as a regulator of payment systems. This capacity has evolved over time with a general trend toward opening the payment system to more participants, promoting competition between payment system providers, allowing for new technology to alter the system, and to increased the Federal Reserve's regulatory authority over the payment system.

§ 1:3 History of the U.S. payment system—The popularity of paper checks and the beginning of electronic payments

For a long period through the 1960s, paper checks were the dominant form of non-cash payment. The wide acceptance of checks by businesses was made possible through this national network of payment processors and payment services. The advent of computing technology began to change the nature of the payment system in the 1970s. In the early 1970s, the Federal Reserve developed the Automated Clearing House system (ACH), which is still a major payment system today.¹ At the beginning ACH transactions were almost exclusively done by banks for large businesses using an electronic file of specific payment requests. In 1971 there were just under 500 million electronic payments processed in the United States. While that might seem like a substantial figure, there were over 23 billion checks written in that same year.² Put another way, checks constituted 98% of non-cash payments compared with electronic payments, which were only 2%.

§ 1:4 History of the U.S. payment system—The rise of credit cards

The idea of using a card to access funds for the purpose of transactions was first popularized in the late 19th century in

[Section 1:3]

¹http://www.philadelphiafed.org/publications/speeches/santomero/2005/09-10-05_pacb-128th-annual.cfm.

²Calculation based off of payment data from Federal Reserve Bulletin 2008, Volume 94 and US census data <http://www.federalreserve.gov/pubs/bulletin/2008/articles/payments/dlink/chart2.htm> and <http://www.census.gov/population/estimates/nation/popclockest.txt>.

the novel *Looking Backward* by Edward Bellamy.¹ The practice of using charge cards actually began in the early 1900s mostly by oil companies and department stores. In this era, trusted customers were given paper cards by which transactions could be kept. These transactions did not generally involve the extension of credit.²

The popular story of the creation of the first widespread credit card involves Frank McNamara, a businessman who forgot his wallet at a restaurant in New York City. This experience led him to develop The Diners Club Card as a charge card by which holders could pay their bill at select restaurants. This idea quickly caught on and by 1951, there were 20,000 Diners Club cardholders.³ The incentive structure for The Diners Club Card is interesting. Restaurants were incentivized to accept the card to increase their customer base, particularly because those who had access to the card were presumably more frequent diners. Customers may have been attracted to the novelty, the longer settlement time as compared to check or cash payment, and the ease of payment.

Note that the Diners Club card began as a charge card. The difference between a charge card, in which the card holder can use the card for payment but must pay his or her balance in full, and that of credit card, in which the issuer of the card provides credit to the card holder, is that they may not have to repay their account in full at the end of each billing cycle. The Diners Club Card was a “closed-loop” system in which the card issuer handles all aspects of the transaction, settling directly with both the consumer and the merchant.⁴ The American Express Company, formed in 1850 and providing money orders and traveler’s checks also used a “closed-loop” system for their charge card.⁵ American

[Section 1:4]

¹Edward Bellamy, *Looking Backward 2000-1887*, with a Foreword by Erich Fromm, Signet, 1960.

²Stan Sienkiewicz, Credit Cards and Payment Efficiency, Federal Reserve Bank of Philadelphia, August 2001.

³<https://www.dinersclub.com/home/about/dinersclub/story>.

⁴Stan Sienkiewicz, Credit Cards and Payment Efficiency, Federal Reserve Bank of Philadelphia, August 2001.

⁵<http://www.creditcards.com/credit-card-news/credit-cards-history-1264.php>.

Express is often credited with introducing the first plastic card at the end of the 1950s.⁶

The 1960s saw the formation of the “open-loop” system, which allowed for transactions across networks, requiring inter-bank cooperation and funds transfer. There were two major players in this space: Bank of America, whose BankAmericard brand became Visa, and the Interbank Card Association, whose brand evolved into MasterCard.⁷ By creating an “open-loop” system, consumers were able to use cards tied to their banks to make purchases at merchants whose bank had no direct relationship with the consumer’s bank. This transformed the payment system as merchants were now free to accept a card from any customer using the network with the assurance that the network could coordinate payment between the two banks.

The importance of this system is best understood with the appreciation of how many different commercial banks existed in the United States during this period. There were significant restrictions on interstate banking and branching, which had the effect of limiting most banks to operating in one state. Throughout the 1960’s there were over 13,000 banks in operation in the United States. However those institutions operated only 20,000 branches in 1969. By 2013 the number of banks have fallen by more than 50%, as there were 5,876 banks in operation. However, the number of branches has grown by more than 400%, with almost 84,000 branches in operation in 2013.⁸

§ 1:5 The shift toward electronic payments and away from checks

The use of electronic payments grew rapidly through the 1970s. While in 1971 there were 500 million electronic transactions, by the end of the decade there were 5.5 billion electronic payment transactions conducted annually. From 1971 to 1979, there was an increase of more than ten-fold of

⁶<http://www.creditcards.com/credit-card-news/credit-cards-history-1264.php>.

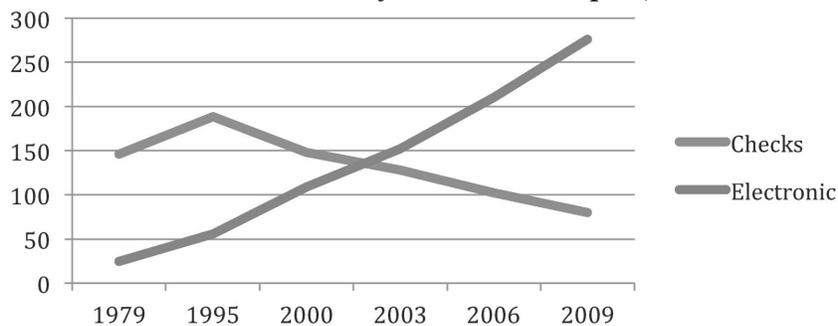
⁷Stan Sienkiewicz, Credit Cards and Payment Efficiency, Federal Reserve Bank of Philadelphia, August 2001.

⁸FDIC, Number of Institutions, Branches and total Offices, Table CB01, <http://www2.fdic.gov/hsob/HSOBRpt.asp>.

electronic payments processed annually.¹ Electronic payments and checks were continuing to co-exist as check payments had also grown substantially, with just under 33.8 billion checks written in 1979.² As a share of the non-cash payment system, checks now constituted 85% and electronic payments were up to 15%.

Check usage would continue to rise on a per capita basis throughout the 1980s even as electronic payments grew. However, 1995 marked the peak of check usage with almost 200 checks written per person that year. Within 15 years that number would fall by more than 50%. Electronic payments replaced checks at an aggressive rate, rising from 50 per person per year to over 250 per person per year within that same time frame. The chart below demonstrates the rapid shift away from checks to electronic payments. By the end of the last decade in 2009, there were over 84 billion electronic payments made per year, constituting more than three-quarters of all non-cash payments.³

Checks vs. Electronic Payments (Per Capita, Per Year)*



The decline in check usage extends beyond consumers to businesses as well. According to the Association for Financial

[Section 1:5]

¹Calculation based off of payment data from Federal Reserve Bulletin 2008, Volume 94 and US census data <http://www.federalreserve.gov/pubs/bulletin/2008/articles/payments/dlink/chart2.htm> and <http://www.census.gov/population/estimates/nation/popclockest.txt>.

²<http://www.federalreserve.gov/pubs/bulletin/2008/articles/payments/dlink/chart2.htm>.

³http://frbervices.org/files/communications/pdf/research/2010_payments_study.pdf.

*<http://www.federalreserve.gov/pubs/bulletin/2008/articles/payments/dlink/chart2.htm> and http://frbervices.org/files/communications/pdf/research/2010_payments_study.pdf.

Professionals, the typical business-to-business (B2B) payments by check decreased from 74% in 2007 to 50% in 2013.⁴ The transfer on the business side may be more recent and indicates that the movement away from checks will continue. The same survey reported that, “Just under half of survey respondents indicate that their organizations are very likely to covert the majority of their B2B payments to major suppliers from checks to electronic payments in the next three years.”⁵

Today, almost all checks written end up being cleared through an electronic form. This occurs either through conversion to an ACH payment or by electronic imaging. Approximately one out of every six checks is transferred into an electronic image by the consumer when he or she deposits them into their account.⁶ Electronic imaging required federal legislation, The Check Clearing for the 21st Century Act, which was enacted in 2002. Within a decade this legislation has completely transformed the way that checks are processed.

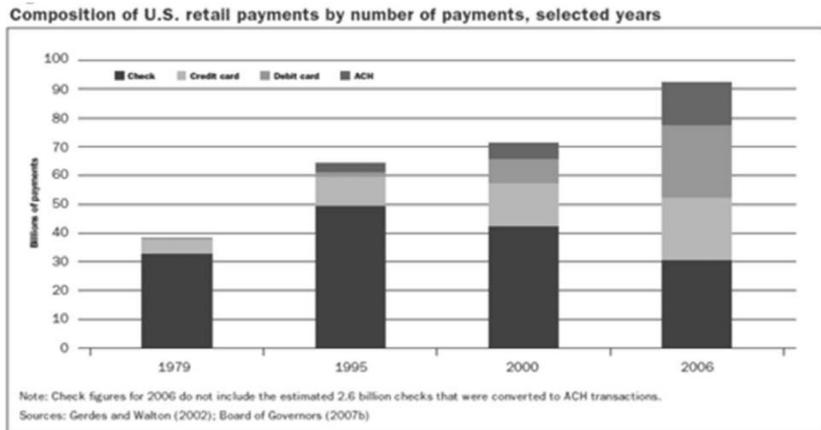
⁴Association for Financial Professionals, 2013 AFP Electronic Payments Survey.

⁵Association for Financial Professionals, 2013 AFP Electronic Payments Survey.

⁶http://www.frbservices.org/files/communications/pdf/research/2013_payments_study_summary.pdf.

§ 1:6 Different types of electronic payments

With electronic payments replacing checks as the dominant form of non-cash payment it is worth noting the three major forms of electronic payment in the market place today: credit cards, debit cards, and direct ACH transactions. The chart below shows the growth of each form of electronic payment for retail transactions from 1979 to the pre-recession era of 2006. Total retail payments more than doubled from just under 40 billion to just over 90 billion. Despite this total doubling, the number of checks written in 2006 for retail payments was below the number written in 1979. Thus, more than the entire growth has come from the rise of electronic payments.



These trends continued over the last decade with the number of checks being written falling by 50% between 2003 and 2013. Debit cards overtook credit cards for use in payment in 2004-2005 and today are nearly twice as common as credit card payments. Finally, the introduction of prepaid cards has introduced a new and accelerating form of electronic payment into the system. Almost a decade ago there were less than 1 billion prepaid card transactions a year. With current growth trends there will likely be more than 10 billion transactions in 2014.

Number of payments by Type 2003-2012¹

Total (billions)	2003	2006	2009	2012
Credit cards	19.0	21.7	21.0	26.2
Debit cards	15.6	25.0	37.5	47.0
Prepaid card	0.8	3.3	5.9	9.2
ACH	8.8	14.6	19.	22.1
Checks	37.3	30.5	24.5	18.3

§ 1:7 Credit cards

Credit cards are comprised of “open-loop” systems such as Visa and MasterCard and “close-looped” systems such as American Express. The major distinction between the systems is that an open-loop allows any two banks to facilitate payment and settlement through the system, while in the close-looped system the payment company provides settlement to both parties. These systems have co-existed over the past half-century. In the current marketplace, open-loop systems offer lower fees to merchants (typically in the range of 2%), while the dominant close-looped system of American Express charges slightly more (around 3% of the transaction). American Express historically had not been a bank holding company, but converted to a bank holding

[Section 1:6]

¹http://www.frb services.org/files/communications/pdf/research/2013_payments_study_summary.pdf.

company, regulated by the Federal Reserve, in 2008 during the last financial crisis.¹

As the name implies credit cards also carry with them the provision of credit from the issuer to the user. The terms of this credit are regulated by multiple federal agencies, including the primary regulator of the institution providing the credit (e.g. the FDIC, OCC or Federal Reserve) as well as by the Consumer Financial Protection Bureau (CFPB) who regulates the transaction from the consumer stand point. Much more will follow on the regulatory specifics.

§ 1:8 Debit cards

Debit cards differ from credit cards in that they do not involve an extension of revolving credit. Rather they involve the direct transfer of funds from a bank account to the merchant's payment provider. Debit cards have been around since 1966, although their usage was miniscule until the late 1990s when their popularity and usage took off.¹ In 1995, debit cards were only 2% of noncash payments.² By 2009, debit card usage had risen to almost 35% of noncash payments, with almost 38 billion transactions occurring per year.³ Between 2009 and 2012 the number of debit card payments increased more than any other payment type.⁴

There are many reasons for the growth in debit card transactions. The Kansas City Federal Reserve's payment system research department summarized three major advantages as follows:

- Debit cards offer consumers a payment choice that many of them now prefer
- Processing an online debit transaction is less costly to merchants than an offline debit card, credit card, or check transaction; and

[Section 1:7]

¹http://www.nytimes.com/2008/11/11/business/11amex.html?_r=0.

[Section 1:8]

¹<http://www.marketplace.org/topics/business/news-brief/short-history-debit-card>.

²<https://www.kansascityfed.org/publicat/PSR/BksJournArticles/ATMPaper.pdf>.

³http://frbervices.org/files/communications/pdf/research/2010_payments_study.pdf.

⁴http://www.frbervices.org/files/communications/pdf/research/2013_payments_study_summary.pdf (p. 6).

- The risk of fraud is lower with online debit than other methods of payment.⁵

The sharp growth in debit card transactions received legislative scrutiny in the Dodd-Frank Act. Section 1075 of the Act, also known as the Durbin Amendment after its chief sponsor Senator Richard Durbin (D-IL), required the Federal Reserve Board to proscribe standards for reasonable interchange fees payable to certain debit card issuers in connection with debit card purchases.⁶ In June 2011, the Federal Reserve Board released final implementing regulations.⁷ One of the major effects of this regulation was to cap interchange fees for most debit card transactions at 21 cents per transaction plus five basis points of the value of the transaction. Coupled with additional permissible fees related to other factors, such as anti-fraud, the Federal Reserve Board estimates that the average debit card transaction in the amount of \$38 would generate a 24 cent interchange fee.⁸ This was a significant reduction from previous levels, which some estimated averaged closer to 50 cents for the average debit card transaction.⁹

§ 1:9 Automated Clearing House (ACH)

The Automated Clearing House (ACH) is the largest payments system in the United States. Most payments processed are recurring payments such as salaries, consumer and corporate bills, and interest and dividends.¹ If you have direct deposit or a recurring payment set up, the odds are you have used ACH. The U.S. government is one of the largest users of ACH sending everything from Social Security to veterans' benefits through ACH. When a merchant or on-line payment service requests a bank routing number and ac-

⁵Hayashi, Sullivan, Weiner, A Guide to the ATM and Debit Card Industry, Federal Reserve Bank of Kansas City, 2003, p. 43.

⁶<http://www.paulhastings.com/assets/publications/1803.pdf>.

⁷<http://www.federalreserve.gov/newsevents/press/bcreg/20110629a.htm>.

⁸<http://www.federalreserve.gov/newsevents/press/bcreg/20110629a.htm>.

⁹<http://www.tsys.com/acquiring/engage/white-papers/The-Durbin-Amendment-and-the-Payments-Value-Chain.cfm>.

[Section 1:9]

¹Federal Reserve Bank of New York (<http://www.ny.frb.org/aboutthe/fed/fedpoint/fed31.html>).

count number they are most likely using ACH to process the payment.² An in-depth discussion of the rules, regulations, and structure of ACH can be found in Chapter 6.

Commercial ACH payments are governed by rules established by the National Automated Clearing House Association (NACHA). NACHA was established in 1974 and has evolved into a non-profit association, which includes 16 regional payments associations, more than 10,000 financial institutions as well as other direct members.³ NACHA has three major functions as the administrator of the ACH network:

- Establish and maintain operating rules for the ACH system;
- Pursue innovative uses of ACH. This is done through the Payments Innovation Alliance and affiliated organization; and
- Enforce the rules and help members manage risk over the network.⁴

ACH uses two central clearing facilities, The Federal Reserve and the Clearing House.⁵ The system processes payments in batches matching transactions from originating depository financial institutions to receiving depository financial institutions. The receiving depository financial institution then credits the individual or business account. It is possible for an individual, business or other non-financial institution to be a receiver.

ACH transactions can be debit or credit. Debit transactions settle in just one business day. Credit transactions settle in one to two business days.⁶ Fees are charged to institutions both for membership into the association (annual basis) and based on volume of usage (per-entry fees). Depository financial institutions with volume exceeding 5 million entries annually are required to file quarterly reports, while those with volumes under 5 million file annual reports.⁷

ACH can also be used to transmit funds internationally.

²<http://www.consumerfinance.gov/askcfpb/1065/what-is-an-ach.html>.

³<https://www.nacha.org/about>.

⁴<https://www.nacha.org/about>.

⁵<https://www.nacha.org/ach-network>.

⁶<https://www.nacha.org/ach-network>.

⁷<https://www.nacha.org/ach-network/administration-fees>.

These transactions are referred to as International ACH Transactions (IAT). IAT's require the following data elements to be transferred:

- Originator's name/address;
- Beneficiary's name/address;
- Originating bank name/ID/branch code;
- Foreign correspondent bank name/ID/branch code;
- Receiving bank name/ID/branch code; and
- Reason for payment.⁸

ACH volumes have grown substantially. In 1993, ACH handled 2.1 billion transactions totaling \$7.6 trillion in value.⁹ Twenty years later in 2013, ACH volume had grown ten-fold to almost 22 billion transactions with over \$38.7 trillion in value.¹⁰ Note that with volume growing about twice as fast as a dollar value, the average size of each ACH transaction has fallen by about 50% over the past twenty years.

About one-in-seven, or 15%, of ACH transactions are originated on-line (over the internet or a wireless network) in 2013. These 3.3 billion transactions totaled \$1.5 trillion in value, which is slightly less than 4% of total volume. Thus, on-line transactions are typically significantly smaller dollar value. This makes sense when one considers the more likely consumer to business or person-to-person nature of those transactions when compared to transactions such as direct deposit or Social Security benefits. On-line traffic grew by 11% in 2013, almost three times as fast as total ACH volume, which grew by only 4%.¹¹

§ 1:10 Money transmitters

The Treasury Department's Financial Crimes Enforcement Network (FinCEN) defines the term money transmitter as "a person that provides money transmission services, or any other person engaged in the transfer of funds. The term 'money transmission services' means 'the acceptance of currency, funds, or other value that substitutes for currency from one person and the transmission of currency, funds, or other value that substitutes for currency to another location

⁸http://www.frbservices.org/help/fedach_iat.html#a1.

⁹<http://www.ny.frb.org/aboutthefed/fedpoint/fed31.html>.

¹⁰<https://www.nacha.org/news/ach-volume-grows-nearly-22-billion-payments-2013>.

¹¹<https://www.nacha.org/news/ach-volume-grows-nearly-22-billion-payments-2013>.

or person by any means.”¹ This broad definition includes electronic currencies, electronic precious metals, and centralized and de-centralized convertible virtual currencies.² This definition will also capture many electronic wallets (e-wallets).³

Perhaps the most famous money transmitter in U.S. history is Western Union. Established in 1851, Western Union introduced its money transfer business in 1871.⁴ Western Union has been at the forefront of technological advances over the last 150 years. Notable advances have included providing international service in the 1890s, introducing consumer charge cards in 1914, and integrating money transmission services into automated teller machines (ATMs).⁵ Additional examples of money transmitters include MoneyGram and PayPal.

MoneyGram and Western Union rely heavily on an agent-based model, where consumers give funds in one location with specific instructions for receipt at another location. This model has been adapted for consumers to initiate transactions on-line.

American Express is another company with deep roots in the money transmitter business. The Traveler’s Cheque was created by American Express in 1891 as a way for business and consumers travelling abroad to transmit funds without having pre-arranged letters of credit or carrying large sums of cash.⁶ American Express’s product differed from the wire transfer services provided by Western Union in that there did not need to be a prearranged recipient at the time the transaction was initiated.

The most well known emerging money transmitter is PayPal. PayPal operates a very different model in which

[Section 1:10]

¹http://www.fincen.gov/statutes_regs/guidance/pdf/FIN-2013-G001.pdf.

²http://www.fincen.gov/statutes_regs/guidance/pdf/FIN-2013-G001.pdf.

³E-finance and payments, *Law and Policy Journal*, August 2012, Issue 8. (<https://docs.google.com/file/d/0BzSMG5T2ZjIYNDJvT25PRnBqej/edit?pli=1>).

⁴<http://corporate.westernunion.com/History.html>.

⁵<http://corporate.westernunion.com/History.html>.

⁶<http://creditcardforum.com/american-express/25-history-american-express-cards.html>.

consumers initiate transactions on-line, generally through e-mail addresses linked to accounts. PayPal has more than 100 million active accounts. PayPal can transfer funds directly between consumers through both funds deposited in the PayPal account, or through existing credit card or bank accounts. This model will be discussed in greater detail in the next section on emerging forms of electronic payments (Section 1:11).

Regulation of money transmitters is based at the state level, a topic discussed in additional detail in section 3:4. Additional regulation of money transmitters in their role as international providers is done through the CFPB pursuant to the new remittance rule required under Section 1073 of the Dodd-Frank Act., which is discussed in detail in section 2:24

§ 1:11 Emerging forms of electronic payments

The field of electronic payments can be thought of through several different lenses. One key question is who initiates the payment, the consumer or the merchant. Another question involves whether the payment is conducted through a hard-wired terminal or through a mobile terminal. Traditional forms of electronic payments have been conducted through hard-wired terminals, whether as part of an open or closed loop system. The consumer or the merchant could initiate the payment, depending on the technology. For example, a consumer could begin a transaction with a check, which the business could turn into an ACH transaction through a point of sale conversion. All of this is changing as technology provides additional alternatives both within the existing payment system and as new payment system alternatives.

§ 1:12 Retailer payments

Businesses are expanding into alternative forms of electronic payments through a variety of means. One expansion involves new mechanisms to facilitate existing electronic payment systems. Specifically, new technology allows smart phones to accept point of sale payment from credit cards. In this scenario, the merchant uses a mobile device to process a payment through the existing payment system. This is usually a credit or debit card, although it could be an ACH conversion of a check. Leading firms involved in this field are Square, Intuit, and Verifone.

One way to think about technology such as Square is that it is simply creating more terminals to process existing electronic transactions. This benefits existing networks, such as credit and debit cards, as it expands the ability and ease of using that payment means. For example, many taxis now accept credit or debit cards far more easily because the driver can use his or her smartphone to process the transaction. It benefits retailers who want to electronic payments, including those who previously accepted them but required a consumer to physically go to an existing terminal. Department stores clerks with Square can now check out consumers anywhere in the store, as opposed to having to return to a cashier's terminal.

§ 1:13 Consumer payments

Consumer to consumer transactions was a weakness of the electronic payment system before the advent of financial technology. The costs of using a third-party system created were generally insurmountable when compared to the alternative of using cash or writing a check. However, checks required either physical interaction, or enough trust to assure that a check would come through the mail. Both were costly and limited consumer to consumer payments. Financial technology changed that, starting the PayPal.

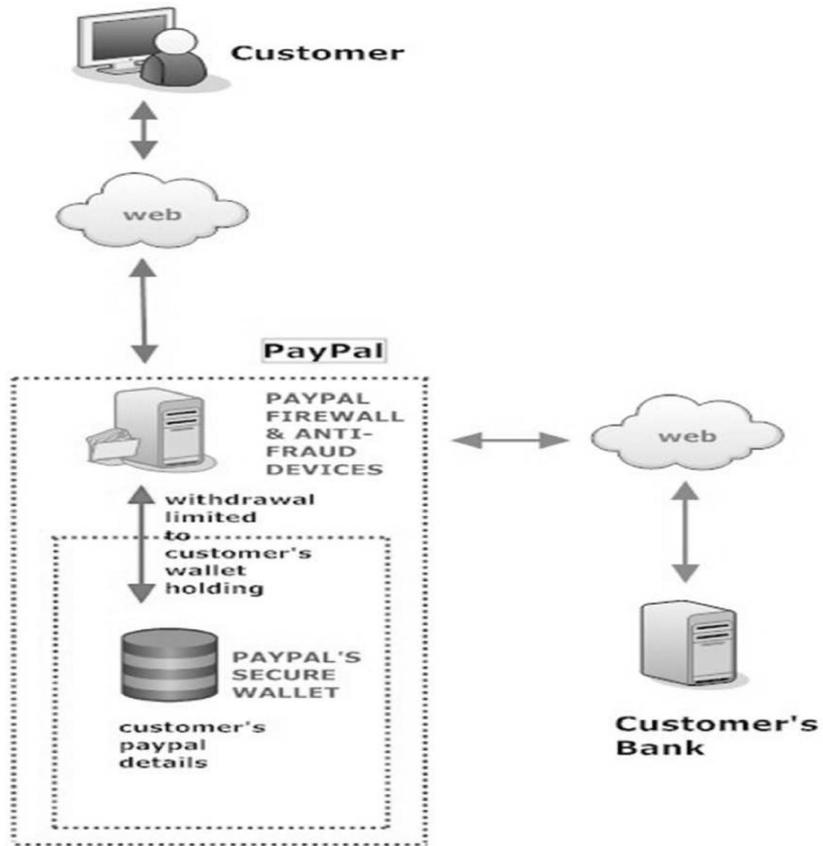
PayPal was created in 1998 originally to allow individuals to transfer funds on handheld devices.¹ PayPal is a payment service provider that transmits funds between individual accounts. These funds can come from existing payment sources, such as credit or debit cards, as well as funds stored in an individual's PayPal account. Funds stored in a PayPal account can be transmitted back to an individual's financial institution. PayPal does not provide interest on funds in its accounts nor does it perform other bank-like features as PayPal is not currently a bank.

PayPal began as a closed-loop system. However, beginning 2009, it partially opened its platform to allow other payment providers to use its platform, called PayPal X.² This is an interesting development given the parallels with early credit card systems. The PayPal model can be visualized as:

[Section 1:13]

¹<https://www.paypal-media.com/history>.

²<http://gigaom.com/2009/11/03/paypals-partially-open-platform-to-us-her-in-new-payment-models-apps/>.



§ 1:14 Mobile payments

The payment system exists in order to facilitate the transfer of funds from one entity to another. The easier it is to execute the transaction away from official terminals, the more valuable the payment system can become. The growth in mobile phone technology, specifically in smartphone capability and adoption has created an exciting opportunity for advancements in mobile payments.

Mobile phone adoption is reaching extremely high levels. Eight out of nine Americans have a mobile phone. Sixty percent of Americans have a smart phone. Within smart phone users, roughly half have used mobile banking services in some form. Forty percent of mobile bank users have used it to deposit a check. This is one mechanism by which electronic payments are replacing checks.¹

Use of mobile banking is not correlated to income or educational level. This indicates substantial growth potential. This is particularly true among lower income consumers. According to the FDIC, nearly 10 million households, roughly 1 in 12, are unbanked. This includes approximately 17 million adults who do not have any deposit account with a financial institution.² Within that population 70% have mobile phones, half of which are smart phones. Put another way, approximately 6 million American adults lack a bank account, but have smartphones, which are capable of accessing the payment system.

The addition of mobile payments to mobile banking is a step forward in the adoption of technology to serve a broader array of financial purposes. As researchers from the Federal Reserve Banks of Boston and Atlanta describe it: “Initially, the focus has been on enabling a mobile device to be used as a browser, accessing existing internet-based banking and retail systems. More recently, attention has turned to the use of an application-enabled mobile phone as a payment form factor, substituting for a check, cash or a card to eventually create a mobile virtual wallet. Financial institutions are

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¹<http://www.federalreserve.gov/econresdata/consumers-and-mobile-financial-services-report-201403.pdf>.

²http://www.fdic.gov/householdsurvey/2012_unbankedreport_execsum.pdf.

testing these capabilities, as are numerous non-banks, including some who operate in the internet space.”³

Despite the new focus on mobile payments, research indicates that mobile payment use is growing more slowly than mobile banking. In 2013, roughly one of our four smartphone users has used mobile payments, the same share as in 2011.⁴ Overall, growth in usage of mobile payments is thus, being driven at the moment by increased smart phone adoption and not more fundamental shifts in consumer behavior. Those may be forthcoming.

The large potential market for mobile payments has not yet broadly adopted mobile payments for a variety of reasons. The Federal Reserve studied the situation and found, “The main factors limiting consumer adoption of mobile banking and payments are security concerns and the belief by some that these services fail to offer any real benefits to the user over existing methods for banking or making payments.”⁵

Interestingly, the already advanced payment system in the United States is one reason for delayed adoption of mobile payments. Although the United States has a relatively high rate of unbanked consumers compared to other well-developed countries, globally the rate of unbanked individuals is much larger. It is estimated that more than one billion people lack access to traditional financial services worldwide.⁶ That indicates that mobile payments may be adopted faster in some countries where the existing payment system is not as developed. This concept is explored in greater detail in Section 7.

§ 1:15 Summary

The payment system in the United States is dynamic and evolving. Electronic payments have displaced checks as the dominant form of non-cash payment. New technology and legislation has effectively resulted in almost all checks being turned into electronic form at some point during processing.

³Contini, Crowe, Merrit, Oliver, and Mott, Mobile Payments in the United States Mapping Out the Road Ahead, Federal Reserve Bank of Atlanta, March 25, 2011, page 4, http://www.frbatlanta.org/documents/rprf/rprf_pubs/110325_wp.pdf.

⁴<http://www.federalreserve.gov/econresdata/consumers-and-mobile-financial-services-report-201403.pdf>.

⁵<http://www.federalreserve.gov/econresdata/consumers-and-mobile-financial-services-report-201403.pdf>.

⁶https://www.frbatlanta.org/documents/rprf/rprf_resources/wp_0810.pdf.

Within electronic payments, methods of transactions have shifted dramatically. Credit cards were the major alternative to checks for over three decades, but have been overtaken by debit cards as the most popular form of electronic payment. Prepaid cards, a minor form of payment a decade ago, have grown by over 10 fold in the past ten years. Mobile payment technology, currently still being developed, could upend the entire system as a new and emerging form of payment. Legislative and regulatory action can have a major impact on the types of payments used and the costs of using those payments. Consumer and businesses respond to this dynamic and mobile environment by changing their demand and usage of payment instruments. While the future of the payment system is uncertain, history indicates that it will likely be substantially different in the next decade as the result of new financial technology.