nonbanks in the payments system

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Foreword

Nonbanks have always been a key component of the nation's payments system, contributing to the breadth and competitiveness of the industry. In recent years, however, nonbanks have become even more prominent. As the nation's central bank, it is important that the Federal Reserve track and analyze major developments in the payments system, including the rise in nonbank participation.

This book represents an important step in gaining a better understanding of nonbanks in the payments system. It examines nonbank participation along two dimensions: the payments activities in which nonbanks are involved and the roles nonbanks play in specific transaction types. The analysis identifies 35 distinct activities in which nonbanks have a market presence and nearly 30 transaction types in which nonbanks play a role. It also addresses a number of risk considerations.

The book presents several findings. Nonbanks are pervasive, both in traditional and emerging payments areas. Nonbank business relationships with banks and other participants in the payments system are often highly complex and interrelated. Nonbanks are rarely directly involved in settlement activities and, hence, to date appear to be associated with limited settlement and systemic risk. But nonbanks and banks alike are increasingly susceptible to operational risk factors.

It is likely that nonbanks will become even more prominent in the payments system in the future. Technological advances, increased outsourcing, and the steady shift from paper to electronics all are working to create a myriad of new market opportunities. Nonbanks undoubtedly will continue to play a major role in this dynamic environment. It is the intent of this book to shed some light on such events as they unfold.
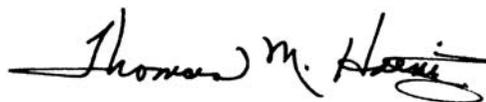
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President and Chief Executive Officer
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Acknowledgements

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1 Introduction

Banks have traditionally played a dominant role in the U.S. payments system. Because that system has historically relied heavily on deposit-based instruments, especially checks, banks have been in a unique position to offer payments services to consumers and businesses.

In recent years, however, nonbanks have become more visible in the payments system. Nonbank participation is not new. Nonbanks always have been a key component of the nation's payments system, enhancing the efficiency, breadth, and competitiveness of the industry. What is new is nonbanks' higher visibility and greater prominence. Whether it is back-office processing or front-end consumer interaction, nonbanks have become more of a market force. And this trend has been noted by Federal Reserve policymakers (Hoenig 2000, Ferguson 2002).

The heightened visibility of nonbanks in the payments system raises several important questions. In which payments activities are nonbanks engaged? What roles do nonbanks play in specific payments types? What types of risk are potentially associated with nonbank participation?

This book represents a first step in addressing these questions. The following are among the preliminary observations:

- Nonbanks are pervasive in the U.S. payments system. They are involved in a myriad of activities and roles, both in traditional and emerging payments types.

- Nonbanks usually are not directly involved in settlement activities. They typically have a relationship with a bank or other financial institution for settlement purposes.

- While nonbanks appear to be associated with limited settlement and systemic risk, they are susceptible to other types of payments system risk, especially operational risk.

- Nonbank business relationships with banks and other participants in the payments system often are highly complex and intertwined.

- In light of nonbank pervasiveness, complexity, and risk potential, it is essential to track and better understand nonbanks' roles in the payments system.

The book is organized as follows. The next chapter provides an overview of nonbanks in the payments system. It documents the types of activities in which nonbanks are involved and the types of risk that they and other participants in the payments system potentially face. The following two chapters of the book systematically detail nonbanks' roles in specific retail transaction types. Both traditional and emerging payments types are examined, in Chapters 3 and 4, respectively. The book closes with a summary and suggestions for further research. A glossary of terms used in the payments industry also is included.

2 Overview

Nonbank payments activities

Nonbanks are an integral part of the payments system. They perform functions at all stages of the payments process. For example, nonbanks are heavily involved in the back-office processing of many traditional payments instruments, such as checks and automated clearinghouse (ACH) transactions. In other traditional payments types, such as automated teller machine (ATM) and credit card transactions, nonbanks often are at the forefront, highly visible to the end user. And in the world of emerging payments, for example, Internet bill payment and online person-to-person transactions, nonbanks are often the trendsetters leading the way. Nonbanks have shown themselves to be fundamentally important to the U.S. payments system.

This chapter provides an overview of the principal types of nonbank payments activities. The focus here is on payments activities—actual processes undertaken or products and services offered—as opposed to specific roles in specific transaction types, which are the focus of Chapters 3 and 4. This is a useful distinction to make for two reasons: 1) focusing on activities gives a sense of the breadth of nonbank participation and presence and highlights some key firms that are involved in a number of activities, and 2) focusing on specific roles in specific payments types gives one a better understanding of how a given transaction takes place and, in particular, where nonbanks enter the process.

The term "nonbank" can be defined in many ways. This book defines a nonbank as any firm that is not a bank, where a "bank" is an institution that accepts demand deposits.[1] Some nonbanks, of course, are owned or governed by banks, with two prominent examples being the Visa and MasterCard credit card associations. This book encompasses all nonbanks but tends to focus on those without bank ties.

As already noted, nonbank presence is significant in many payments activities. For example, among core data processing that is outsourced, three nonbank firms—Fiserv, Metavante, and Alltel—have an 80 percent market share (Global Concepts 2002).[2] Among personal identification number (PIN)-based debit card processors, two nonbank firms—Concord and First Data/NYCE—have a 63 percent share (Hayashi and others, 2003). And in the online person-to-person market, one nonbank—PayPal—has an 80 percent market share (Neumann and Sullivan 2002). While these are just three examples, they do illustrate the importance of nonbank participation in some key categories.

Because of data limitations, it is not possible to determine whether nonbank participation is rising overall.[3] But there are at least two reasons to suspect it is. First, there are reports that banks are increasingly outsourcing payments activities to third parties. Second, the U.S. payments system is steadily shifting from paper-based to electronic transactions.

Banks have long had the option of outsourcing various payments activities to outside firms. Such activities range from core data processing to providing Internet banking platforms. Some industry observers forecast that the trend to out-source will continue to accelerate in coming years (Fung 2001). Others argue that it is difficult to make a firm assessment (Malhotra 2002). To the extent outsourcing becomes even more prevalent than it is today, nonbank presence in the payments system clearly will be enhanced.

The second factor that likely will boost nonbank presence is the ongoing shift from paper to electronics. Recent studies by the Federal Reserve System indicate that the U.S. payments system is becoming more electronic (Federal Reserve 2002, Gerdes and Walton 2002). Checks' share of total retail noncash payments was 86 percent in 1979. By 1995, it was 77 percent, and by 2000, it was down to 59 percent. This implies that more than 40 percent of all retail noncash payments now are being made electronically, using such instruments as credit cards, debit cards, ACH transactions, and emerging payments. Moreover, the check process itself is becoming more electronic through the use, for example, of digital imaging services. As a result, there are scores of new market opportunities for banks and nonbanks alike. In such an environment—dynamic, changing, and highly competitive—nonbanks, in particular, may be expected to be aggressive and bold.[4] Examples of nonbanks that have figured prominently in recent high-profile industry developments include Concord (ATM and debit card networks), First Data (card issuer and merchant services), Fiserv (core processing), CheckFree (Internet bill payments), and PayPal (Internet person-to-person payments).

Table 1 shows how extensive the range of nonbank payments activities is. Thirty-five types of activities are listed and grouped into three broad areas: authorization, processing, and instrument provision. For each activity, a brief description is given and examples of nonbank companies are shown. It is important to note that the degree of nonbank participation varies across activities. It also should be stressed that while the table highlights nonbanks, banks also are involved in many of these activities, sometimes extensively. Table 1 and the discussion that follows draw heavily on Global Concepts 2002.[5]

Table 1: Nonbank Payments Activities

Activity	Description	Representative Nonbanks
Authorization		
Check Authorization Vendors	Supply check authorization and guarantee services to merchants.	eFunds, TeleCheck
Fraud System Vendors	Provide fraud detection services to merchants and financial institutions.	Thomson Financial, Bridger Systems
Online Transaction Security Systems	Provide online transaction security systems to merchants and financial institutions.	Baltimore
Certificate Authorities	Provide certificate-authority services in PKI-based secure environments.	Verisign, iTrust, Identrus
Authorization ISOs	Provide check verification and credit and debit card authorization services to small and medium-sized businesses.	Heartland Payment Systems, CardService International
Processing		
Hardware Providers	Provide ATM and POS terminals, plastic cards, etc.	Diebold, Hypercom, NCR, Orbethur
Software Providers	Provide banking software.	Fiserv, S1
Core Data Processors	Provide processing for demand deposit account and core systems.	Fiserv, Alltel, Jack Henry
Check Outsourcers	Provide internal check processing services to banks.	Fiserv, EDS, Metavante
In-House Remittance Processors	Billers and other corporates that perform their own remittance (lockbox) processing.	GE Capital, American Express, State Farm
Remittance/Lockbox Processors	Provide remittance (lockbox) processing to corporates and some areas of banks, e.g., credit card bill payments, loan payments.	Regulus, Remitco
Check Clearinghouses	Provide check clearing and settlement services to banks.	WesPay, NYCH/SVPCo
Archive Services	Provide payment-related archive and retrieval services.	ViewPointe
Payroll Service Providers	Provide payroll and related tax services to private and public sector employers.	ADP, Ceridian, PayChex
ACH Outsourcers	Provide internal ACH processing for banks.	Fiserv, EDS, Metavante, CheckFree
ACH Operators	Provide central clearing functions (receipt, editing, and transmission) for ACH network participants.	EPN, Visa
Card-Issuer Processors	Provide processing services to general-purpose card issuers, including the issuing of statement, receipt, and deposit of payments.	First Data, TSYS
Card Merchant Processors	Provide merchant processing services to banks and merchants.	First Data, Concord
Credit Card Networks	Provide networks for clearing and settlement of credit card transactions.	Visa, MasterCard, American Express
EFT Networks	Provide networks for clearing and settlement of ATM and debit card transactions.	Concord/Star, First Data/NYCE, Visa, MasterCard
ATM ISOs	Provide ATM services such as sales, leasing, and management, typically to nonbank organizations.	eFunds, E*Trade, American Express
EBT Service Providers	Manage the distribution and tracking of EBT funds to recipients.	eFunds, Lockheed Martin
EDI VANs	Provide network and software to effect EDI payments and document exchange between large corporates.	Sterling Commerce, Harbringer Corporation
EIPP Service Providers	Provide network and security services for business-to-business payments.	Bottomline

Table 1 (continued): Nonbank Payments Activities

Activity	Description	Representative Nonbanks
Internet Banking Platform Providers	Host Web banking platforms for banks.	Digital Insight, Metavante
EBPP Service Providers	Provide bill payment services for consumers and presentment and payment receipt services for billers.	CheckFree, Metavante, Princeton eCom
P2P Internet Payment Providers	Provide payment solutions for online person-to-person payments.	PayPal, Western Union
Retail Wire Services	Provide money transfer (money wire) services to consumers.	Western Union, MoneyGram, Travelers Express
Check Cashing Services	Provide check cashing services.	ACE Cash Express, Pay O Matic
Instrument Provision		
General-Purpose Credit Card Issuers	Issue general-purpose credit cards or charge cards.	American Express, Discover, Diners' Club
Private-Label Credit Card Issuers	Merchants that offer store credit cards and third parties that provide card-issuing services to merchants.	Chevron, GE Capital
Debit Card Issuers	Issue debit cards to consumers for retail purchases and fleet debit cards to companies for retail purchases.	Exxon, Mobil
Stored-Value Card Issuers	Issue stored-value cards for closed or open systems.	Stored Value Systems
Money Orders	Issue money orders.	United States Postal Service, Travelers Express
Travelers Checks	Issue travelers checks.	American Express, MasterCard/Cook, Visa

Sources: Global Concepts 2002, Hayashi and others, 2003

The first several activities in Table 1 represent authorization activities. Before a transaction can take place, it may have to be authorized and approved. Examples of such activities include check authorization, fraud detection, online security systems, certificate authorities, and authorization independent sales organizations (ISOs). Nonbanks play a particularly important role in check authorization: In 2001, about 10 billion checks were verified or guaranteed, with nonbanks controlling virtually the entire market. Nonbanks also were the leading certificate authorities (firms involved in authenticating online users).

The second broad group of activities in Table 1 involves processing. This encompasses a wide range of activities. The first three in some sense are the most basic, providing early-stage infrastructure: hardware providers, software providers, and core data processors. Nonbanks have a large presence in all three. Nonbanks, for example, dominate the hardware category (ATM terminals, cash registers, point-of-sale (POS) terminals, plastic cards, etc.) and are major suppliers of traditional and Internet-related banking software. And, as noted earlier, nonbanks also are important core data processors, especially for small and medium-sized banks. The large majority of the biggest banks (those with assets of more than $10 billion), in contrast, keep their core data processing in-house.

The next set of payment activities centers on check processing. Many of these include nonbank involvement. Activities include check outsourcing, in-house remittance processing, remittance and lockbox processing, check clearinghouses, and archive services.

Nonbank check outsourcers—firms that perform such tasks as check capture and encoding—handle from 5 to 10 percent of the total checks processed. The leading check outsourcer is Fiserv. One reason for writing checks, of course, is to pay bills. Approximately two-thirds of the 11 to 16 billion remittance checks written are processed in-house by large nonbank billers, including insurance, utility, and financial services companies. The remaining one-third are outsourced to lockbox processors, mainly banks; however, nonbanks such as Regulus and Remitco also have a share of this market.[6] Regarding the clearing of checks, of the 70 percent that are cleared (30 percent are "on-us"), approximately 25 percent of these are cleared through private clearinghouses such as WesPay and NYCH/SVPCo.[7] These clearinghouses are nonbanks, but most are owned by banks and other financial institutions. Finally, the majority of check-archiving services is handled in-house, an exception being services performed by the (partially bank-owned) nonbank ViewPointe.

Turning to ACH-related payments activities, in 2001, more than 2.5 billion direct deposit payments were originated through the ACH network. It is estimated that nonbank payroll service providers, such as ADP and Ceridian, were involved in the origination of as many as 50 percent of these deposits. Historically, there has been heavy nonbank participation among ACH outsourcers as well. Large ACH outsourcers, such as Fiserv, EDS, and Metavante, originate millions of ACH transactions annually; EDS, for example, processed 95 million ACH transactions in 2000. ACH network operators, in contrast, are characterized by a dominant bank presence. The Federal Reserve cleared nearly 74 percent of ACH transactions in July 2002, for example, while the other two operators, EPN and Visa, both bank-owned, cleared the remaining 26 percent.[8]

The next set of activities centers on credit, debit, and ATM card activities. As with ACH-related activities, the card networks are largely controlled by banks or bank-owned nonbanks. The many processing activities surrounding card transactions tend to be dominated by nonbanks.

One of the largest card-related activities is card-issuer processing. Two nonbanks, First Data and TSYS, dominate this market. First Data has more than 300 million domestic card accounts on file, while TSYS has more than 250 million accounts. Together, First Data and TSYS provide processing services for almost 40 percent of accounts. First Data also is the leading nonbank card merchant processor, controlling 42 percent of the market. More than half of First Data's volume, however, is from joint ventures with banks such as Chase, Wells Fargo, and Wachovia.

The two largest credit card networks, Visa and MasterCard, are bank-owned associations. Conversely, the electronic funds transfer (EFT) networks used for ATM and online debit card transactions have a large nonbank presence. Concord/Star's market share of ATM and PIN-based transactions is about 60 percent. NYCE, which is 64 percent owned by First Data, has roughly an 11 percent market share.[9]

Nonbanks also are important operators of ATM terminals. In 2002, the top 10 ATM ISOs had management contracts for about 17 percent of total ATMs. Leading firms include eFunds, E*Trade, and American Express. In addition, nonbanks have a presence in Electronic Benefits Transfer (EBT) service provision, examples being eFunds and Lockheed Martin.[10]

The remaining activities in the processing group represent an assortment, the common attribute being a closer connection to the end-user. Some facilitate the exchange of business-to-business (B2B) information, such as EDI VANs and B2B payment services. Others facilitate consumer-to-business exchanges, including Web platform hosting and the provision of electronic bill presentment and payment services. Bottomline, Digital Insight, CheckFree, and Metavante are some of the principal players in these markets. A third subcategory is online person-to-person payments, with PayPal the dominant firm. And a fourth subcategory might be termed "walk-up" services, including retail wire services (e.g., Western Union and MoneyGram) and check cashing services (e.g., the ACE Cash Express chain). Nonbanks dominate throughout these activities.

The final broad group of payments activities in Table 1, instrument provision, is what the term suggests—the provision of actual payments instruments. The first category is general-purpose credit card issuers. This category includes both bank issuers, operating under the auspices of the bank-owned Visa and MasterCard card associations, and nonbank issuers, principally American Express, Discover, and Diners' Club. The second category is private-label credit card issuers, e.g., retailers and gas stores. Many of these issuers turn to other third parties such as GE Capital for processing. Debit card issuers comprise an important third category. The majority of debit cards are issued by banks belonging to one or more of the regional or national EFT networks or offline debit card networks, but some nonbanks issue debit cards as well. Stored-value cards, money orders, and travelers checks round out the final group. Nonbanks play a dominant role in all three.

This discussion of nonbank payments activities highlights how important and prevalent nonbanks are in the U.S. payments system. The next section outlines the types of risk that they and other payments system participants potentially face.

Payments system risks

Risk is inherent in payments systems. By definition, the purpose of a payments system is to transfer funds from one party to another; hence, some risk is inevitable. Completely eliminating such risk would be counterproductive, however, causing payments flows to be cumbersome and impeding the trading of goods and services. The goal is to strike a balance between safety and efficiency and to have controls in place that limit risk at both the overall (system) and individual (firm and consumer) levels.

Many different types of risk arise in payments systems, and they often are interrelated. Loosely speaking, one can think of these risks as forming something of a hierarchy, ranging from risks that are broad in scope and affecting many parties to risks that are narrower in scope and affecting fewer parties. From a public policy standpoint, this hierarchy can in some sense be viewed as running from most serious to least serious, but all types of risk are problematic.

Central banks are most concerned with systemic risk. Systemic risk is the risk that the failure of one party in a payments system will lead to the failure of other parties in the system, having a domino effect that may eventually be transmitted to other parts of the financial system or economy. Discussions of systemic risk occur most often in the context of large-value, or wholesale, payments systems, across which huge sums of money flow every day.[11] In the United States, the two principal large-value payments systems are Fedwire and CHIPS—two electronic systems that banks use to transfer large payments among themselves (Shen 1997). Around the globe, central banks and other regulatory bodies like the Bank for International Settlements devote considerable resources to monitoring and evaluating such large-value systems. Indeed, much of the analysis of systemic risk in recent years has focused on the relative merits of real-time gross settlement systems versus multilateral netting systems. The result has been a movement toward greater adoption of the former.[12]

One step down from systemic risk is what the Bank of England calls system-wide risk. *System-wide risk* refers to situations in which, in the event of a shock, the amounts transferred through a payments system are too small to have repercussions throughout other parts of the financial system but could be disruptive to that particular system (Bank of England 2000). The impact of the September 2001 terrorist attack on the U.S. check-clearing system might be considered an example.

Related to the notions of systemic risk and system-wide risk is settlement risk. Settlement can be defined as the final, irrevocable transfer of funds between parties in a payments system. *Settlement risk* is the risk that final settlement fails to take place, leading to a financial loss. If settlement failures are widespread, systemic or system-wide losses can occur.

Three types of risk underlie settlement risk: unwinding risk, credit risk, and liquidity risk. *Unwinding risk* refers to the unwinding of financial obligations that can occur if there is a settlement failure in a net settlement system and payments instructions that accumulated during the day are allowed to be revoked (Shen 1997). As noted in the definition, unwinding risk pertains to netting systems only.[13]

Credit risk and liquidity risk have broader applicability. Credit risk is the risk that a party to a transaction will be unable to meet its financial obligations either when due or at any time in the future (BIS). *Liquidity risk* is the risk that a party will have

insufficient funds to meet its obligations when due, although it may be able to do so at some time in the future (BIS). Credit and liquidity risks arise not just in the context of payments systems with many participants, e.g., Fedwire, CHIPS, ACH, and check clearinghouses, but also in "simple" bilateral agreements between buyers and sellers.[14]

Another type of risk that is essentially bilateral in nature but is taking on increasing importance in today's payments environment is operational risk. *Operational risk* is the risk that hardware or software problems, human error, or fraud will cause an operational malfunction that will lead to financial exposure and possible loss (Bank of England).

Nonbanks are conceptually susceptible to all types of payments system risk. But in practice, settlement risk—and any associated systemic or system-wide risk—does not appear to present as big a concern for nonbanks as other types of risk, especially operational risk.

Nonbanks typically are not directly involved in settlement activities. They rarely are direct participants in settlement arrangements but, instead, have relationships with banks. These banks, in turn, undertake final settlement on behalf of nonbanks, typically through Fedwire, the ACH network, or the Federal Reserve's National Settlement Service.[15] All of these settlement mechanisms involve transferring funds from one bank's Federal Reserve account to another bank's Federal Reserve account.[16] This "bank-to-bank" final settlement is a common feature of each of the 29 different transaction schematics described in Chapters 3 and 4.

These schematics also show how complex and interdependent nonbank relationships are with other participants in the payments system. While direct funds transfers appear rare, nonbanks are heavily involved in the transfer of critical payments-related information. These relationships raise several risk-related issues.

Chief among them is operational risk exposure. As technology continues to advance and as banks increasingly outsource payments activities to third parties, the risk of software, hardware, and other operational failures increases. This is a concern that has been highlighted by the Bank of England, for example, in a recent discussion paper (Bank of England 2000). It also is presumably one factor behind the incorporation of operational risk in the new Basel II capital accord.[17]

Operational risk can arise in both internal and external settings. Internally, a bank or nonbank can experience an operations disruption that does not spread beyond that institution. However, if a nonbank, for example, is doing processing work for a bank, an operations disruption in the nonbank could affect the bank's operations as well. This is a bilateral risk that banks (and nonbanks) assume whenever they choose to outsource, and there is a growing awareness among payments participants that such risks must be carefully monitored.[18] But operational risk could have even broader ramifications. The Bank of England, for example, has drawn attention to the possibility of common dependencies such as "common reliance on a particular technology which might constitute a single point of failure for several different systems." In light of this, "The Bank has an interest in any concentration in the use of third-party infrastructure suppliers by UK payment systems" (Bank of England 2000).

A recent World Bank study explores similar issues regarding operational risk (Glaessner and others). In addition, the study highlights the importance of legal risks in today's rapidly changing, increasingly electronic, payments environment. *Legal risk* can be defined as the risk that a poor legal framework or legal uncertainties will cause financial exposure or losses to payments participants (BIS 2001). The study argues that increasing interdependence among financial service providers and technology providers is giving rise to considerable uncertainty about liability issues. Like operational risk, legal risk has become an increasingly important payments system factor, especially in connection with nonbank technology providers.

It would be a mistake, however, to ignore potential settlement risk issues surrounding nonbank payments activities. While it was previously noted that nonbanks are rarely involved in direct settlement, their relationships with other payments participants are often complex and interrelated. A number of nonbank third-party firms, for example, access the ACH system through what might be called "captive bank" relationships. This is a situation in which a bank provides a connection to a large corporate (nonbank) customer and allows that customer to initiate ACH transactions using one of the bank's routing numbers. The bank, therefore, is warranting the transactions without having seen or processed them. While it is true that many of the risks associated with this type of arrangement are addressed in agreements between the two parties and final settlement remains "bank-to-bank," there is significant nonbank involvement. Thus, in monitoring the payments environment, nothing should be taken for granted.

A detailed risk analysis of the payments system is beyond the scope of this book. What this book attempts to do is systematically describe all major retail transaction types, emphasizing where nonbanks enter the process. The following two chapters present detailed schematics and descriptions of traditional and emerging payments types. This analysis provides a foundation for future studies to undertake more detailed risk analysis.

3 Nonbank roles in traditional payments types

Introduction

Traditional retail payments fall into five broad categories: check, ACH, credit card, debit card, and retail wire services. This chapter presents and explains the specific steps involved in these transactions, breaking out, where appropriate, important variants of the broad payments types. The roles played by nonbanks are emphasized throughout this chapter.

Chart 1 shows the 10 payments types examined in this chapter. As noted, there are four check-related entries, one ACH entry, three credit card/offline debit card entries (grouped together because they share a common infrastructure), one online debit card entry, and one retail wire entry. Each payment type is introduced by a brief discussion, followed by a detailed schematic.

The schematics in the figures follow a common format. Nonbanks are shaded in gray; a nonbank positioned "behind" a bank or a bank positioned behind a nonbank denotes a possible intervening relationship; and dashed lines signify final settlement. In addition, when a given payment's final settlement is implemented through another payments mechanism, the schematic makes this clear. Two observations become apparent in surveying these schematics: There is a good deal of gray, that is, significant nonbank involvement. And dashed lines (final settlement) always flow from bank to bank.

Chart 1: Nonbank Roles in Traditional Payments

```
   Check          ACH     Credit Card/        Online         Retail
                          Offline Debit Card   Debit Card    Wire Services

                     |          |                  |             |
                     v          v                  v             v

                    5.          8.                 9.           10.
                    ACH        Card Not       PIN-Based Debit  Western Union
                  Transaction   Present         Transaction     Transaction

   POS    Lockbox        Card Present

   1.                      6.
 Without              Visa/MasterCard
Truncation              Networks

        2.
       With                       7.
     Truncation                First Data
                                 Network

            3.
          Bank as
          Processor

                4.
              Nonbank
            as Processor
```
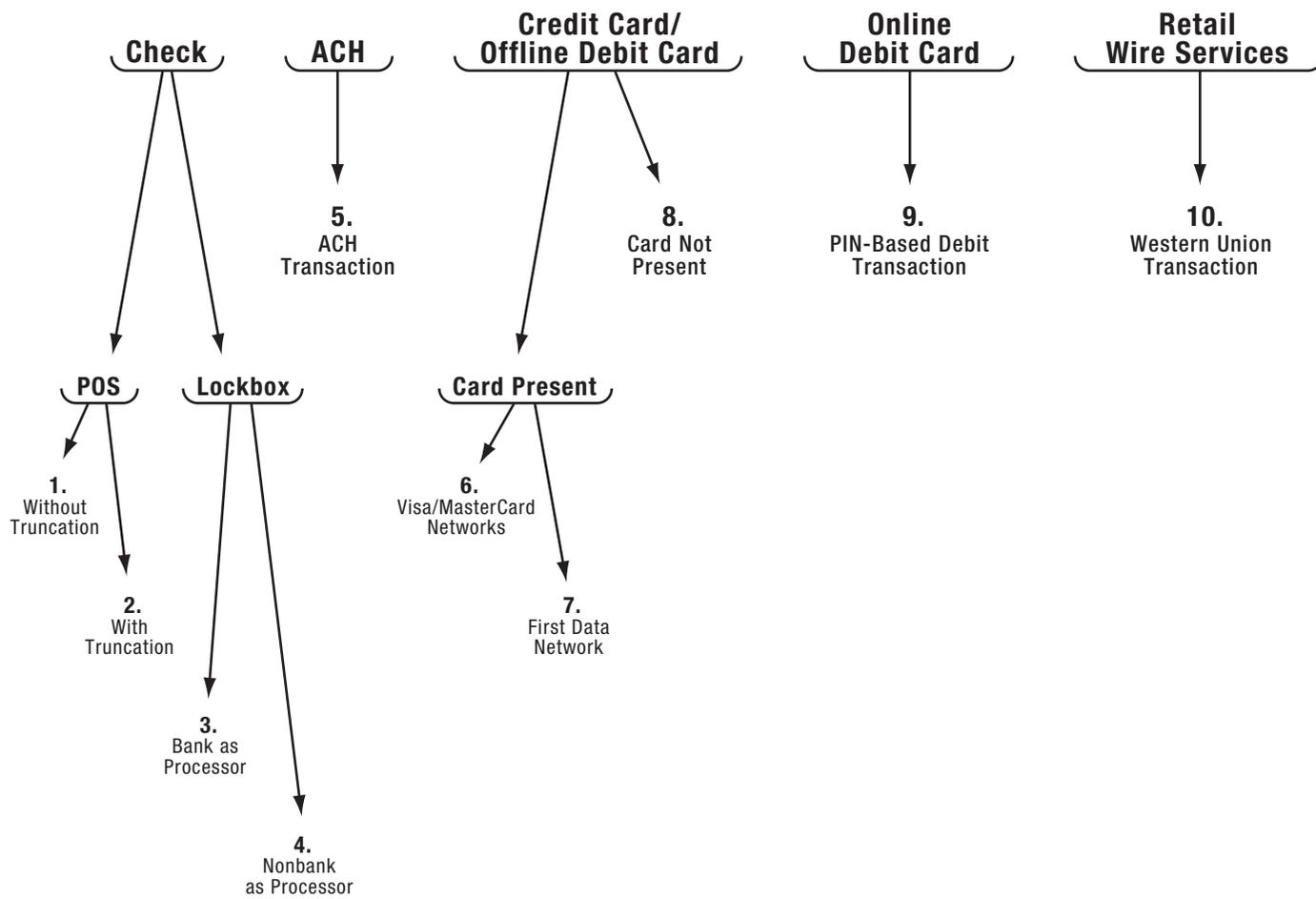
Check

According to the Federal Reserve System Retail Payments Research Project, approximately 42.5 billion checks are written annually in the United States, accounting for $39.3 trillion in payments (Federal Reserve System 2002). The study also examines who is writing checks to whom and for what purpose.

Consumer check payments at the POS account for 14 percent of overall check volume. Traditional processing of these checks can entail handling the paper check throughout the various stages of processing or truncating the check, processing the paper item up to some point, and then processing the payment electronically through the remaining "steps."

Figures 1 and 2 illustrate how a check presented at the POS might be processed. In both figures a consumer paying for a purchase at a POS location with a check initiates the transaction. When the merchant receives the check, it uses vendor-provided software to verify checking account information against databases and, presumably, obtains transaction authorization. The merchant then accepts the check as payment and provides the consumer with a sales receipt. At some point during the business day, the merchant deposits the checks it received with either its merchant bank or its bank's processor. When the check deposit is received by either, the checks are run through check reader/sorter machines to gather debit/credit information.

In Figure 1, either the merchant bank or its processor prepares check cash letters and presents them to other banks and/or clearinghouses. Credits are passed to the merchant's bank, and debits are passed to the consumer's (drawee) bank. Ultimately, the merchant's bank credits the merchant's account, and the drawee bank debits the consumer's demand deposit account (DDA).

In Figure 2, the merchant bank or its outsourcer truncates the checks. So, instead of sending the physical checks to other banks and/or clearinghouses, an electronic file is sent to the Fed. The credit to the merchant's account occurs during the merchant bank or outsourcer's magnetic ink character recognition (MICR) capture process. The Fed debits the drawee bank, and the drawee bank subsequently debits the consumer's DDA.

Another 18 percent of checks are written by consumers for remittance, or bill payment, purposes (Federal Reserve System 2002). Many are mailed to lockboxes. Figures 3 and 4 outline how a check presented at a lockbox might be processed. Again, in both figures a consumer making a bill payment with a check and mailing it to a lockbox initiates the transaction. Once received by the service provider, check information is verified against the payment stub, both items are encoded, payment information is posted for the biller, and MICR line capture and check imaging may be performed. A bank (Figure 3) or a remittance/lockbox processor (Figure 4) may perform these functions. If the biller's service provider is a remittance/lockbox processor, that processor then forwards the checks to its bank or its bank's core data processor. Once the checks are received by a bank or a core data processor, debit/credit information is gathered; on-us items may be outsorted and credits made to the biller's account; and cash letters may be presented to the Fed, to banks with which there is an arrangement, and/or to a clearinghouse. After the banks and/or clearinghouse process the cash letters, settlement may occur via ACH and/or funds transfer. Ultimately, the biller's bank credits the biller's account and the drawee bank debits the consumer's DDA.

Alternatives to the traditional methods of processing consumer checks written at the POS and for remittance purposes do exist. POS checks can be converted to ACH and, potentially, EFT payments. Remittance checks also can be converted to ACH payments, or a consumer can use electronic bill presentment and payment (EBPP), which entirely eliminates consumer-written checks. Discussion of POS alternatives is contained in the text that accompanies Figures 11 through 14, while discussion of ACH conversion of remittance checks can be found in the text that accompanies Figures 15 and 16. Discussion of EBPP can be found in the text that accompanies Figures 17 through 19.

Figure 1: Check: POS—Without Truncation
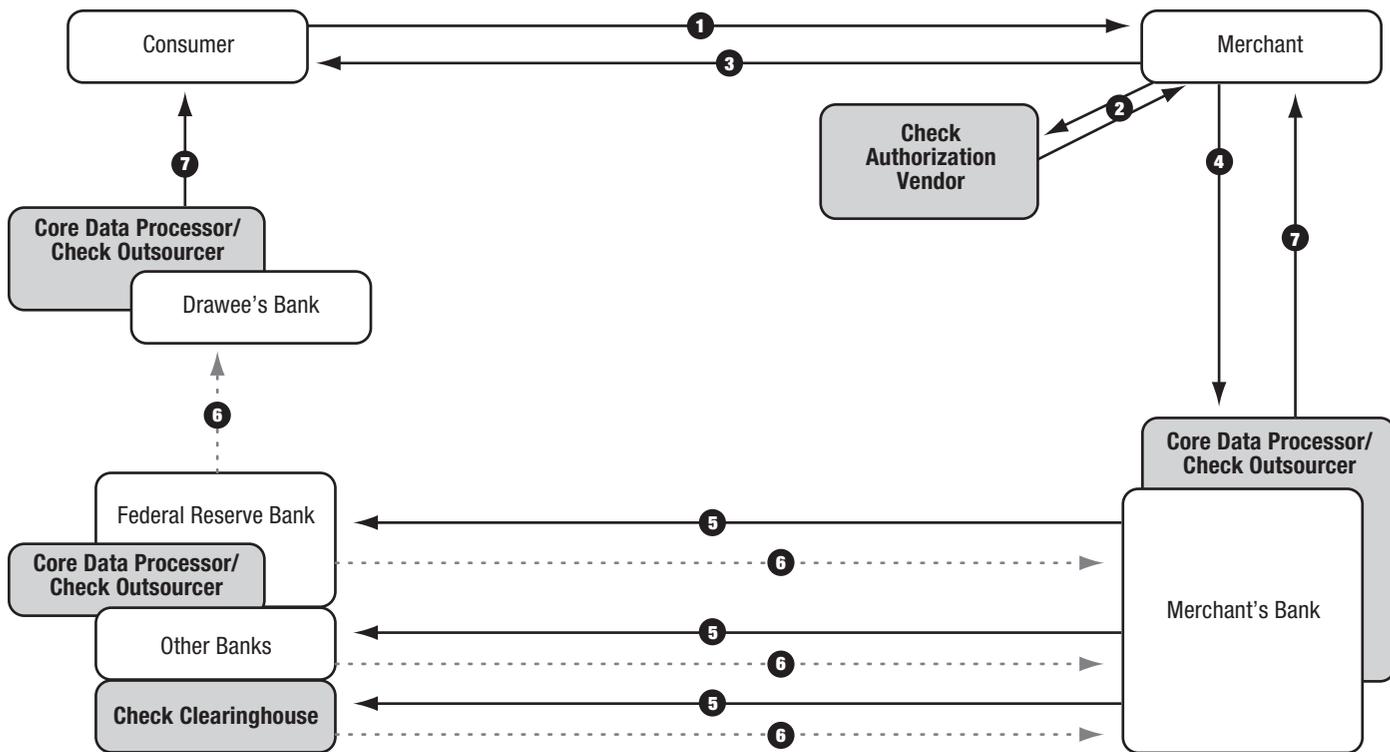
Authorization

1. The consumer writes a check for goods or services at a merchant location.

2. The merchant uses vendor-provided software to verify checking account information against negative databases and completes transaction authorization.

Processing

3. The merchant accepts the check as payment and provides the customer with a sales receipt.

4. The merchant forwards its check deposit to its merchant bank (or potentially a processor for the merchant bank).

5. The merchant bank (or its processor) runs the checks to gather debit/credit information and may:
   - Process on-us items and credit the biller's account (skip to 7);
   - Present a cash letter to the Fed;
   - Send cash letters to banks with which it has an arrangement; and/or
   - Present a cash letter to a check clearinghouse.

Settlement

6. Any credits due to the merchant's bank from other banks or the clearinghouse are passed. The Fed, other banks, and/or the clearinghouse (potentially through the Fed) debit the drawee bank and credit the merchant bank.

7. The merchant bank (or potentially its processor) credits the merchant's account for the items deposited and collected, and the drawee bank (or its processor) debits the consumer's DDA.

Figure 2: Check: POS—With Truncation
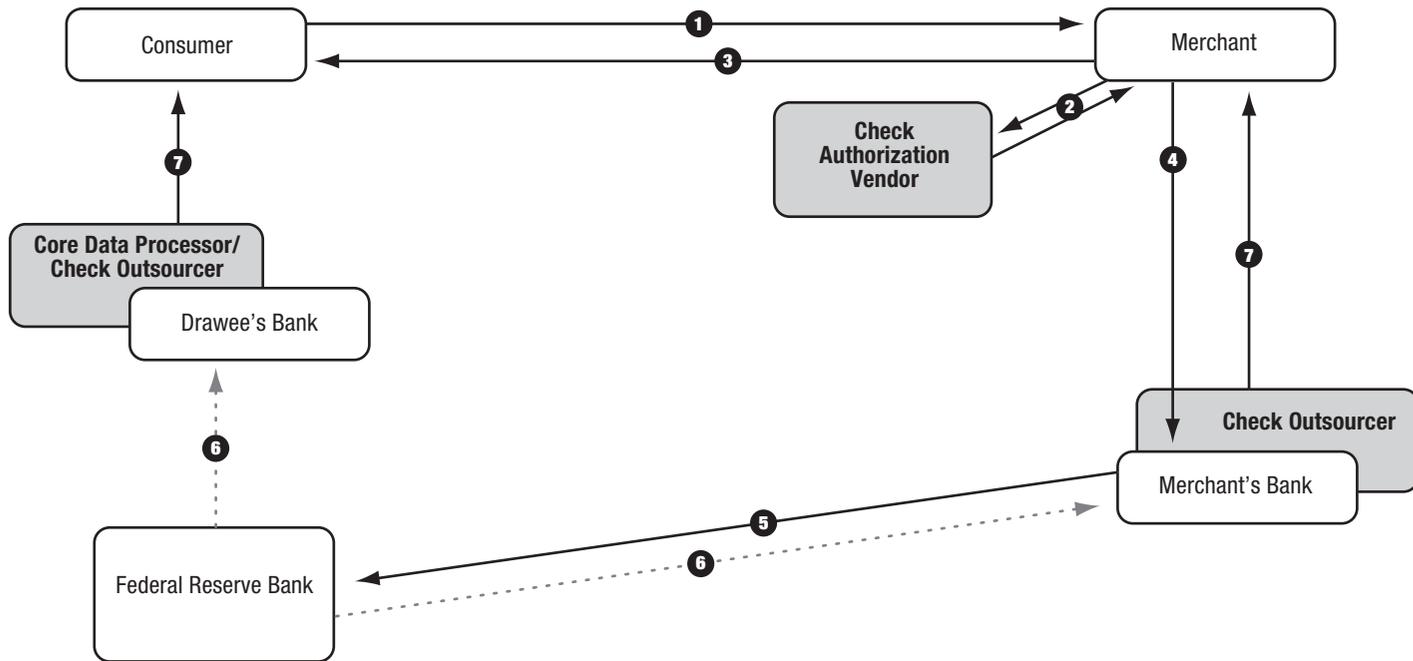
Authorization

1. The consumer writes a check for goods or services at a merchant location.
2. The merchant uses vendor-provided check authorization software to verify checking account information against negative databases and completes transaction authorization.

Processing

3. The merchant accepts the check as payment and provides the consumer with a sales receipt.
4. The merchant forwards its check deposit to its merchant bank (or potentially its merchant bank's processor).
5. The processor runs the checks to gather debit/credit information, sends an electronic file to the Fed, and either truncates the checks or sends the physical items.

Settlement

6. The Fed debits the drawee bank and credits the merchant's bank.
7. The merchant bank (or potentially its processor) credits the merchant's account for the items deposited and collected, and the drawee bank (or its processor) debits the consumer's DDA.

Figure 3: Check: Lockbox—Bank as Processor
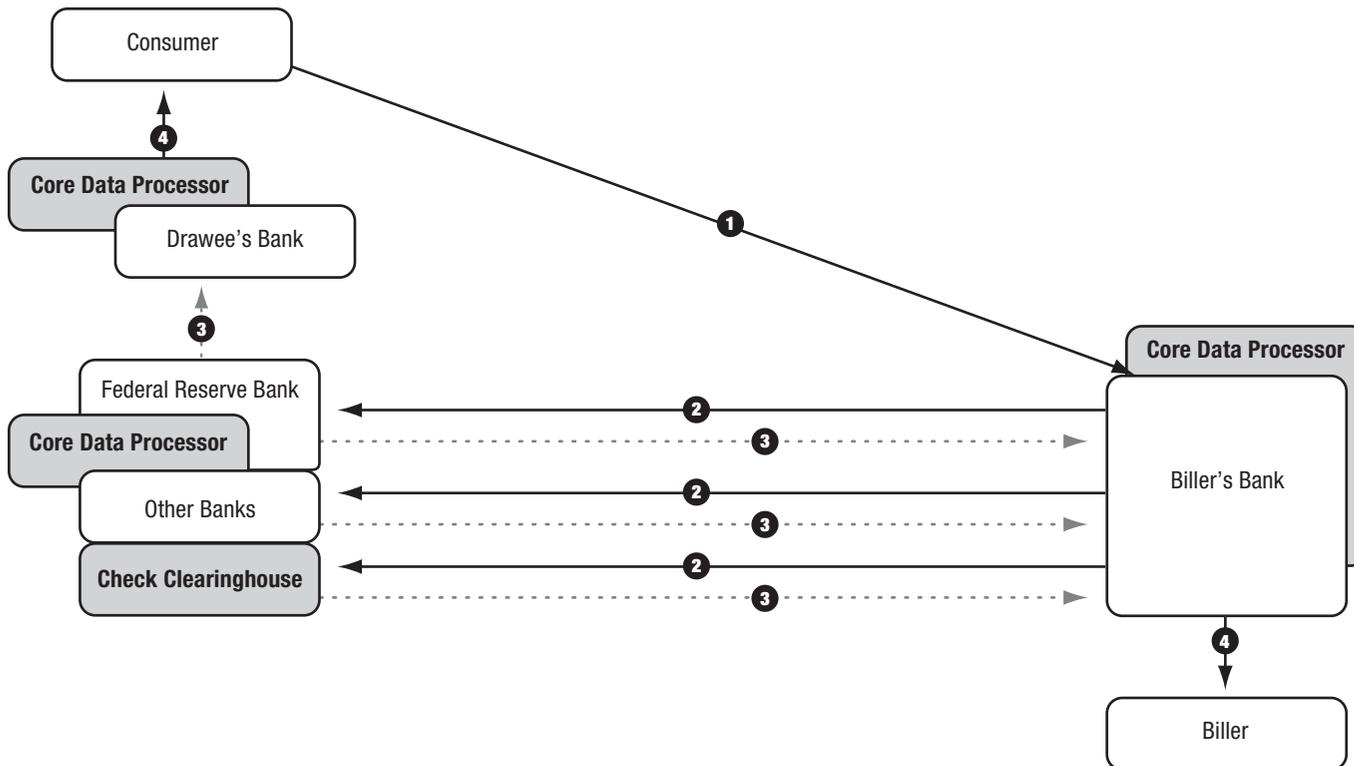
Authorization
1. The consumer mails a check for a bill payment to a lockbox address.

Processing
2. A biller's bank (or potentially its bank's processor) collects and processes the checks by verifying the check against the payment stub, encoding both items, posting payment information for the biller, and potentially capturing the MICR line and imaging the check. The biller's bank then runs the checks to gather debit/credit information and may:
   - Process on-us items and credit the biller's account (skip to step 4);
   - Present a cash letter to the Fed;
   - Send cash letters directly to banks with which it has an arrangement; and/or
   - Present a cash letter to a clearinghouse.

Settlement
3. The biller's bank is credited, and the consumer's (drawee) bank is debited. Settlement may occur via an ACH (refer to Figure 5) and/or funds transfer.
4. The biller's bank (or potentially its processor) credits the biller's account, and the drawee bank (or potentially its processor) debits the consumer's DDA.

Figure 4: Check: Lockbox—Nonbank as Processor

Authorization

1. The consumer mails a check for a bill payment to a lockbox address.

Processing

2. A remittance/lockbox processor collects and processes the checks by verifying the check against the payment stub, encoding both items, posting payment information for the biller, and potentially capturing the MICR line and imaging the check. The processor then forwards the checks to its bank (or potentially its bank's processor).

3. The processor's bank (or its bank's processor) runs the checks to gather debit/credit information and may:

   • Process on-us items and credit the biller's bank (or the biller's account, if it also is the biller's bank)(skip to step 5);

   • Present a cash letter to the Fed;

   • Send cash letters to banks with which it has an arrangement; and/or

   • Present a cash letter to a clearinghouse.

Settlement

4. Credits due to the biller's bank are passed through the processor's bank (or potentially the bank's processor), and the consumer's (drawee) bank is debited. Settlement may occur via an ACH (refer to Figure 5) and/or funds transfer.

5. The biller's bank (or potentially its processor) credits the biller's account, and the drawee bank (or its processor) debits the consumer's DDA.

ACH

The automated clearinghouse (ACH) is an electronic payments network that allows for the clearing and settlement of debit and credit transactions among banks. Only banks may have direct links to the ACH, and, through them, more than 3 million businesses and 100 million consumers originate and receive ACH transactions. The ACH was created in the mid-1970s as part of the government's efforts to begin dispersing electronically the burgeoning number of government payments (such as Social Security). Since then, the ACH has experienced continued growth. The network is governed by the *Operating Rules* of the National Automated Clearinghouse Association (NACHA)—The Electronic Payments Association.

There are currently two ACH operators—the Federal Reserve and Electronic Payments Network (EPN; formerly the New York Automated Clearinghouse, or NYACH).[19] Though EPN is a nonbank, it is bank-owned. For transactions sent through the Federal Reserve, settlement may take place in the Federal Reserve account of each bank or in the Federal Reserve account of designated correspondents. EPN ultimately relies on the Federal Reserve for settlement.

In 2001, nearly 8 billion transactions, with a corresponding value of $14 trillion, were sent over the ACH network. Of those, traditional uses of the ACH, such as for payroll direct deposit and automatic bill payment, accounted for more than 6 billion transactions.

Figure 5 illustrates a basic ACH transaction. The transaction begins with a party providing authorization to an originator. That originator passes entries along to the bank that will serve as the originating depository financial institution (ODFI). The ODFI, in turn, sends entries to the operator, which edits the entries and distributes them to the appropriate receiving depository financial institutions (RDFIs), and effects settlement. The RDFI posts the item(s) to the receiver's account.

As with other payments system applications, the ACH network allows for the participation of third-party processors on behalf of banks. There are four situations in which third-party processors may be participants in the ACH. In the first scenario, a bank allows a corporate customer to send files directly to the ACH operator.[20] In the second, a bank allows a consumer bill payment service to collect and then disburse funds by sending files directly to the ACH operator, using its account at the ODFI as a pass-through account.[21] The third scenario is one in which the ODFI uses a correspondent bank for processing and/or settlement.[22] Finally, in the fourth scenario, the ODFI uses a correspondent bank for processing but not for settlement.[23]

Though the bulk of ACH transactions are generated for traditional payments, the ACH network also is being used for emerging payments. For example, in 1999 NACHA implemented rules that allow for the conversion of paper checks to ACH items. Two such conversion opportunities are paper checks written at the POS and paper checks received at remittance lockboxes. Discussion of these types of transactions is contained in the text that accompanies Figure 11 and Figure 16, respectively.

Figure 5: ACH
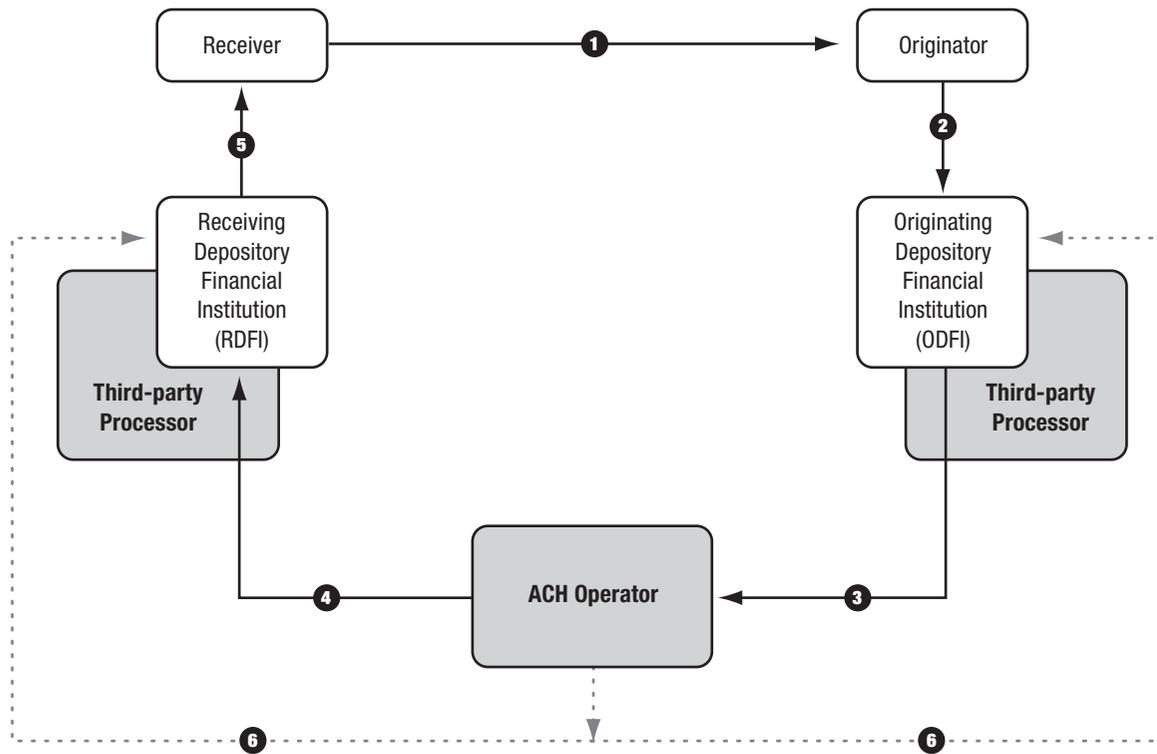
Authorization

   1. The receiver provides the originator with authorization to debit or credit his/her account.

Processing

   2. The originator sends a file of ACH items to the ODFI.

   3. The ODFI sends the file to the ACH operator or to a third-party processor (sending point) who sends the file to the operator.

   4. The ACH operator edits the file and distributes the items in output files to RDFIs or third-party processors (receiving points). The receiving point handles posting of ACH items to the bank's DDA accounts, and the bank can notify the receiving point if any items should be returned or need notifications of change (NOCs).

   5. The RDFI posts the item to the receiver's account.

Settlement

   6. The ACH operator performs settlement for transactions between the ODFI and the RDFI.

Credit card and offline debit card

Credit card networks allow for the clearing and settlement of credit card as well as offline (signature) debit card transactions among participants.

According to the Federal Reserve System Retail Payments Research Project, there were 20.3 billion credit and offline debit card transactions in 2000 (Federal Reserve 2002). Together, they comprised 69 percent of all retail electronic payments in the United States by transaction volume.[24]

There are several credit card networks. Two of the largest are Visa and MasterCard, which are both bank-owned associations.[25] Visa's member banks have issued some 355 million cards in the United States and 804 million worldwide. MasterCard member banks have issued nearly 579 million cards worldwide (*American Banker* 2002b). In addition, through what is termed "private arrangements," First Data Corporation (FDC) is authorizing and settling on-us transactions through its First Data Net product instead of going through the Visa or MasterCard networks.[26]

Figure 6 illustrates a credit card or offline debit card transaction in which the card is present. A merchant uses a card merchant processor (such as FDC), which in turn sends the transaction details over the Visa or MasterCard network for authorization by the issuing bank. After the merchant "captures" the transaction, the card merchant processor originates ACH items to the ACH operator, which then effects settlement between the issuing and merchant banks.

Figure 7 provides a more detailed look at a transaction that takes place through First Data Net. The process works in a similar manner. However, in this case, both the merchant/merchant bank and issuing bank have a relationship with FDC, so the transaction is not run over the Visa or MasterCard network for authorization.

Figure 8 illustrates a credit or offline debit card transaction in which the card is not present. These transactions are identical to card-present transactions (illustrated in Figure 6), except that they are initiated over the Internet or telephone.

Card-present transactions enable merchants to verify by signature and/or identification that the person presenting the card for payment is one who is authorized to do so. When the card is not present, the risk of fraud inherent with card transactions obviously increases. In many cases, a merchant can minimize this risk by having recurring customers set up some sort of shared secret, such as a password or PIN, which will help to authenticate the customer before he or she is allowed to make a payment by credit card. However, if there is no relationship between the customer and the merchant, the merchant simply incurs higher risk of fraud and chargebacks.

Figure 6: Credit & Offline Debit: Card Present—Visa/MasterCard Networks
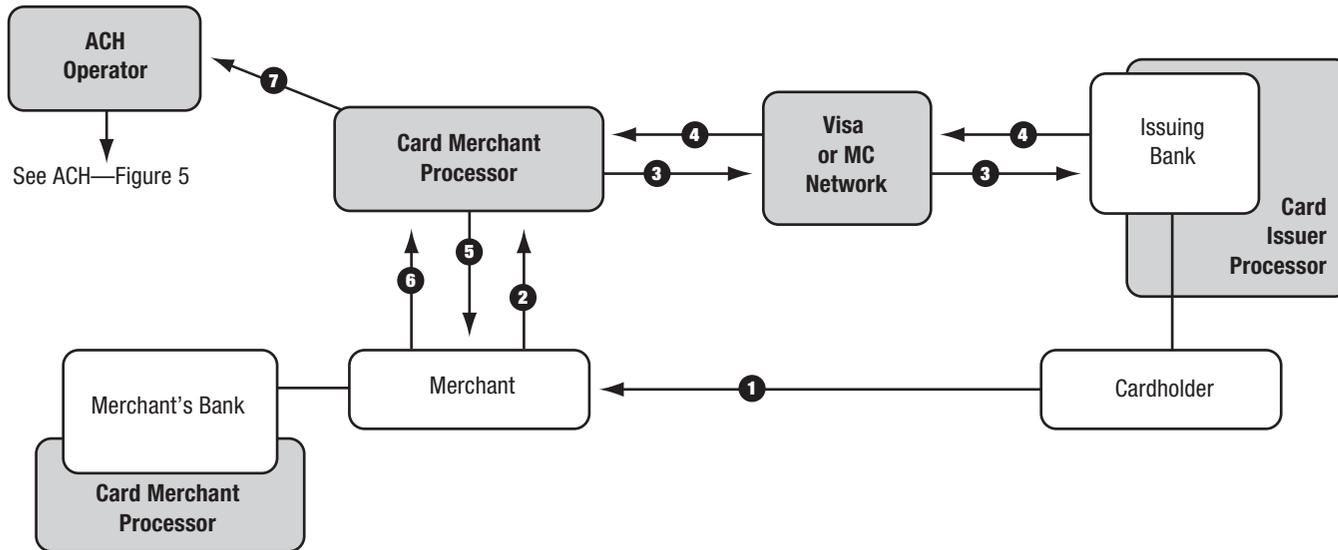
Authorization

1. A consumer uses a credit card to pay a merchant.

2. The merchant sends the encrypted transaction data to a card merchant processor (e.g., First Data Merchant Services) for authorization.

3. The card merchant processor sends the transaction data to the consumer's (issuing) bank over the Visa or MasterCard network. The issuing bank is a licensed member of Visa or MasterCard and holds agreements with, and issues cards to, consumers.

4. The issuing bank authorizes the amount and issues an authorization code or declines the transaction.

5. The card merchant processor notifies the merchant that the transaction either has been authorized or declined. The merchant requests the consumer's signature as authorization for the transaction or notifies the consumer that the transaction has been declined.

Processing

6. Once authorized, the transaction must be "captured" by the merchant. The capture uses information from the successful authorization to charge the authorized amount of money to the consumer's credit card. The merchant accumulates captures and credits into a batch, which then will be settled as a group. The merchant submits the batch to the card merchant processor to finalize the transactions. (If the consumer returns goods after a transaction has been captured, a "credit" is generated.)

Settlement

7. The card merchant processor receives the information and settles the batch, then sends ACH items through the ACH operator to the issuing and merchant banks. (See Figure 5; the merchant bank is the ODFI, with the card merchant processor serving as authorized sending point.) The operator settles transactions between the issuing and merchant banks. The merchant bank credits the merchant's account.

Note: Many merchant banks hire a third party (acquiring processor) for bankcard processing. The processor provides credit card processing, billing, reporting and settlement, and operational services to the merchant bank.

Figure 7: Credit & Offline Debit: Card Present—First Data Network
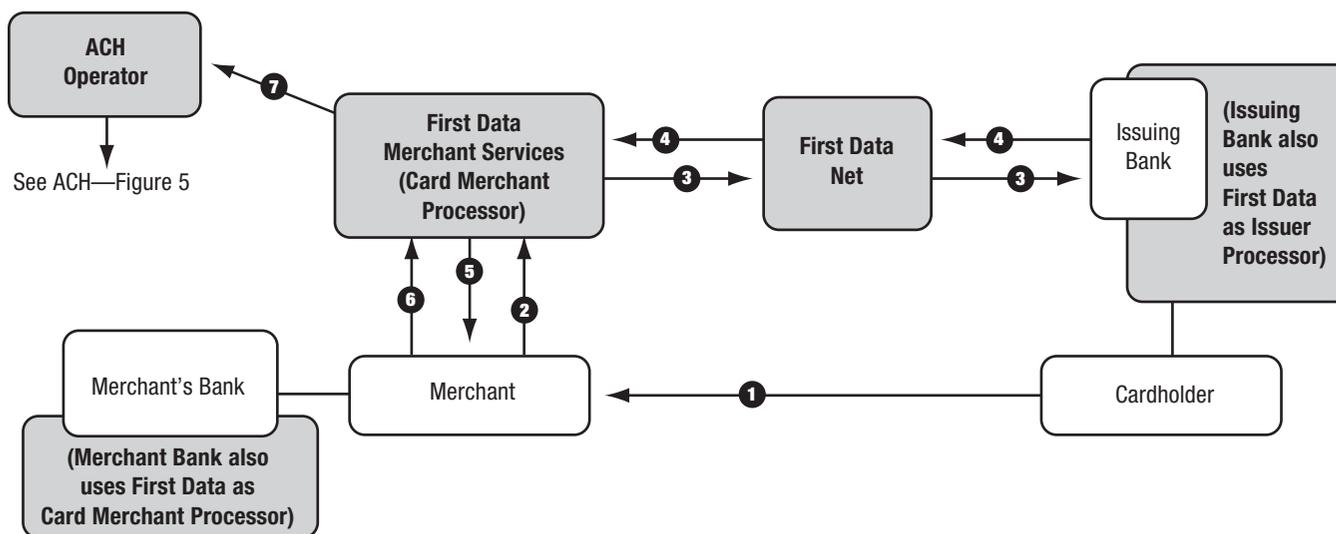
A credit card transaction running through First Data Net is similar to a typical credit card transaction, except that the transaction is routed for authorization not through the Visa or MasterCard network, but instead through First Data's own network.

Authorization

1. A consumer uses a credit card to make a purchase from a merchant.
2. The merchant sends the encrypted transaction data to the card merchant processor, First Data Merchant Services, for authorization.
3. First Data (as card merchant processor) communicates the transaction data to the consumer's (issuing) bank, not over the Visa or MasterCard network as previously mentioned with other credit card transactions. However, the issuing bank, which also is a First Data customer, is still a licensed member of Visa or MasterCard that holds agreements with and issues cards to cardholders.
4. The issuing bank authorizes a certain amount of money and issues an authorization code or declines the transaction.
5. First Data notifies the merchant that the transaction either has been authorized or declined. The merchant requests the consumer's signature as authorization for the transaction or notifies the consumer that the transaction has been declined.

Processing

6. Once the transaction has been authorized, it must be "captured" by the merchant. The capture uses information from the successful authorization to charge the authorized amount of money to the consumer's credit card. As captures and credits come in, the merchant accumulates them into a batch, which will then be settled as a group. The merchant submits the batch to First Data to finalize the transactions. (If the consumer returns goods after a transaction has been captured, a "credit" is generated.)

Settlement

7. When First Data receives the information and settles the batch, it sends payment instructions (ACH items) to the ACH operator (the Federal Reserve). The ACH operator distributes items to the issuing and merchant banks and functions settlement between the two. First Data is set up to serve as an authorized sending point on behalf of many banks and thus can send ACH files to the Federal Reserve using routing numbers of those banks. The merchant bank credits the merchant's account.

Figure 8: Credit & Offline Debit: Card Not Present
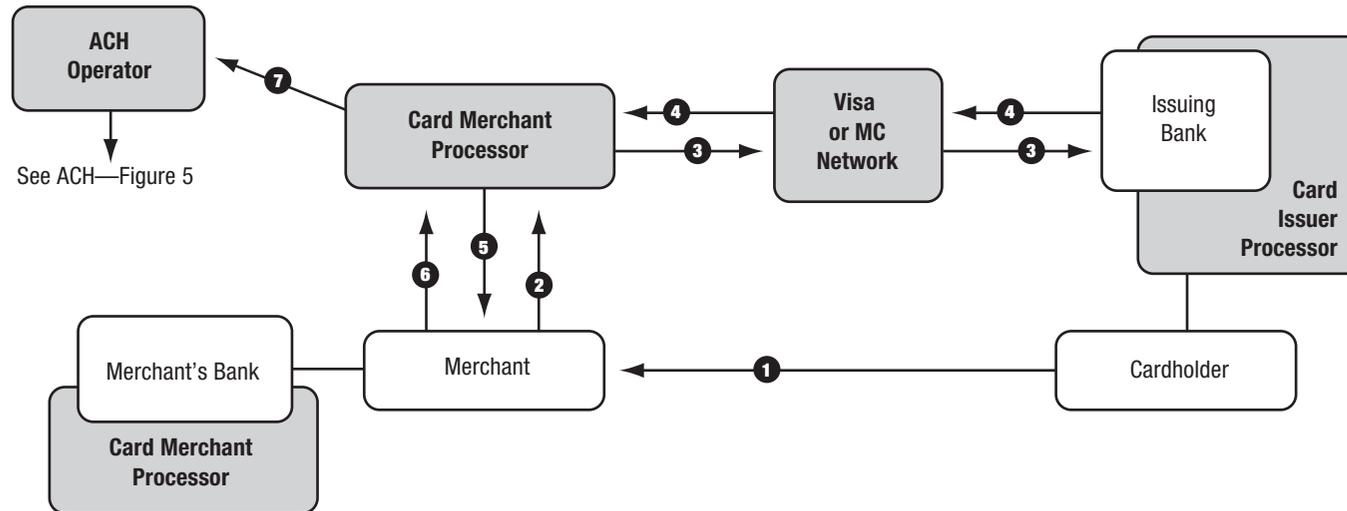
Authorization

1. A consumer uses a credit card to make a purchase from a merchant's Web site. The merchant's e-commerce-enabled Web site prompts the consumer for credit card information and "bill to" and "shipping" addresses.

2. The merchant sends the encrypted transaction data to a merchant acquiring processor (e.g., First Data Merchant Services) for authorization.

3. The acquiring processor sends the transaction data to the consumer's (issuing) bank over the Visa or MasterCard network. The issuing bank is a licensed member of Visa or MasterCard that holds agreements with and issues cards to consumers.

4. The issuing bank authorizes a certain amount of money and issues an authorization code or declines the transaction.

5. The acquiring processor communicates with the merchant's Web site, which notifies the customer that the transaction is either authorized or declined.

Processing

6. Once the transaction has been authorized, it must be captured. The capture uses information from the successful authorization to charge the authorized amount of money to the consumer's credit card. The merchant accumulates captures and credits into a batch and settles them as a group. When submitting a batch, the merchant's payment-enabled Web server connects with the acquiring processor (e.g., First Data) to finalize the transactions.

Settlement

7. When the acquiring processor receives the information and settles the batch, it sends ACH items through the ACH operator to the issuing and merchant banks. (See Figure 5; the merchant bank is the ODFI, with the acquiring processor serving as authorized sending point.) The operator settles these transactions between the issuing and merchant banks. The merchant bank credits the merchant's account. (If the consumer returns goods after a transaction has been captured, a "credit" is generated.)

Note: Many banks hire a third party (acquiring processor) for bankcard processing. The processor provides credit card processing, billing, reporting and settlement, and operational services to the acquiring bank.

Online debit card

An online debit card transaction is one in which a consumer uses a debit card along with a PIN, allowing the merchant to inquire on the consumer's account and verify that the funds are available.

The debit card has been around since the mid-1970s, but it began to experience significant growth in the mid-1990s. In 2000, there were more than 3 billion online debit card transactions in the United States (Federal Reserve System 2002). These transactions are exchanged through EFT networks.

Figure 9 shows an online debit card transaction. This figure represents a simple form of online debit card transaction—one in which both the merchant's bank and the issuing bank belong to the same regional network (a "network on-us" transaction).[27]

Once funds availability is confirmed, the issuing bank automatically deducts those funds from the consumer's available balance. Unlike a credit card or offline debit card transaction, which involves "capturing" the transaction subsequent to approval, all transaction details are sent in the initial message because the consumer has used a PIN. Thus, end-of-day processing will complete the transaction between the merchant and the card issuer.

The settlement process described in Figure 9 is "processor-level settlement," in which the network calculates the net position for each processor and sends ACH items to each processor for settlement. After settlement between network and processors, each processor creates an ACH file for settlement with its customers (card issuing and merchant banks). Though not described in this figure, direct settlement is an alternative.

Potential innovations in the debit card arena include allowing consumers to make PIN-based debit card payments on the Internet. Another program being explored is DebitMan, an alternative POS debit network that would pay interchange to merchants that issue the network's debit cards.[28]

Figure 9: Online Debit
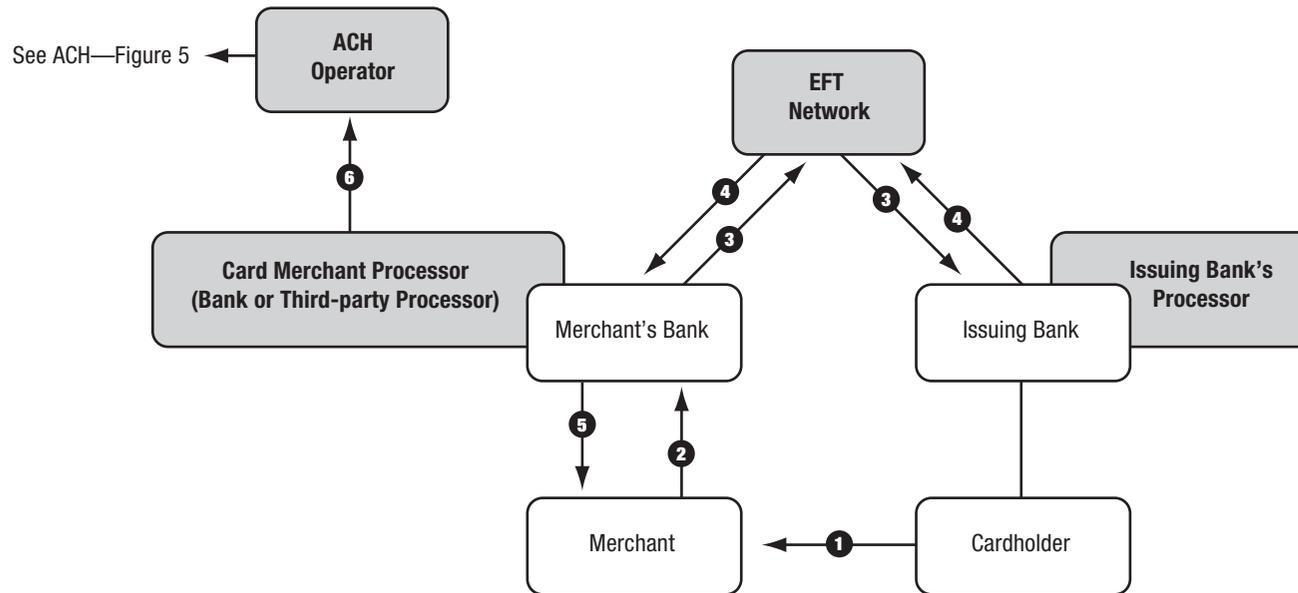
Authorization

1. A consumer uses a debit card for a purchase at a merchant and enters a PIN.
2. The merchant sends the transaction data to the acquiring processor for authorization.
   Note: The merchant acquiring processor may or may not be the same entity as the merchant's bank.
3. The acquiring processor sends the transaction data to the consumer's (issuing) bank via an EFT network.
   Note: To provide a fairly simple view of this process, this schematic reflects a transaction in which both merchant acquiring processor/merchant's bank and issuing bank are members of the same EFT network.
4. The issuing bank verifies the cardholder's PIN and checks the account balance. If the funds are available, the issuing bank authorizes the transaction and immediately deducts those funds from the cardholder's available balance. If funds are not available, the issuing bank declines the transaction.
5. The acquiring processor communicates with the merchant that the purchase has been approved or declined.

Processing

Because funds are immediately debited from the consumer's account when the transaction is authorized, end-of-day processing completes the settlement process between merchant and card issuer. The merchant's acquiring bank/processor received all of the debit card transaction information as it was initially routed through the networks for authorization.

Settlement

6. At the network's cutoff, the processor creates an ACH file including a net debit to each card-issuing bank for all of its customers' online transactions and a net credit to each merchant's bank account for all of its transactions. (See Figure 5 for full details of how the ACH process works.)
   Note: The settlement process described here is referred to as "processor-level settlement." For more information see the discussion accompanying this figure, as well as Hayashi and others, 2003.

Retail wire services

Retail wire services are a traditional form of person-to-person payment that enable consumers to send funds electronically to other individuals. The services often are used by individuals without traditional banking relationships to send money to their home country. However, retail wire services also are used by traditional bank customers in need of emergency money transfer services, by tourists without local bank accounts, and by U.S. businesses that need rapid wire transfer services. In 2000, 130 million money transfers were sent. Nearly 90 million of those were from the United States to other countries (Global Concepts 2002).

The two major nonbank retail wire service providers are Western Union, a First Data company, and MoneyGram. Western Union controls about 66 percent of the market, with MoneyGram and many others accounting for the balance (Global Concepts 2002). Western Union's money transfer service was introduced in 1871 and today enables customers to use cash to send money from nearly 170,000 Western Union agent locations in more than 190 countries around the world. MoneyGram was established in 1988 and has an international network of about 60,000 agent locations in more than 150 countries.

Figure 10 outlines how a retail wire transfer is conducted via Western Union. A consumer wishing to send funds to someone through a Western Union agent location completes a "To Send Money" form. The sender provides the agent with that form along with cash to cover the amount of the transfer and related fees. The agent enters information into a computer linked to the Western Union network. The sender then notifies the recipient that the funds were sent and provides him/her with appropriate information. With that information and some personal identification, the recipient can retrieve the funds at any Western Union agent location. The recipient completes a "To Receive Money" form, provides information given by the sender, and shows proper identification. The agent then uses that information to reference the Western Union network. Upon verification, a check is printed, and if the agent has an appropriate amount of cash on hand, the check is cashed immediately.

Each day, Western Union's bank will initiate an ACH debit to withdraw funds from agents that initiated transfers. At the end of each month, Western Union's bank will pay agents fees earned for monthly transactions.

Figure 10: Retail Wire Services
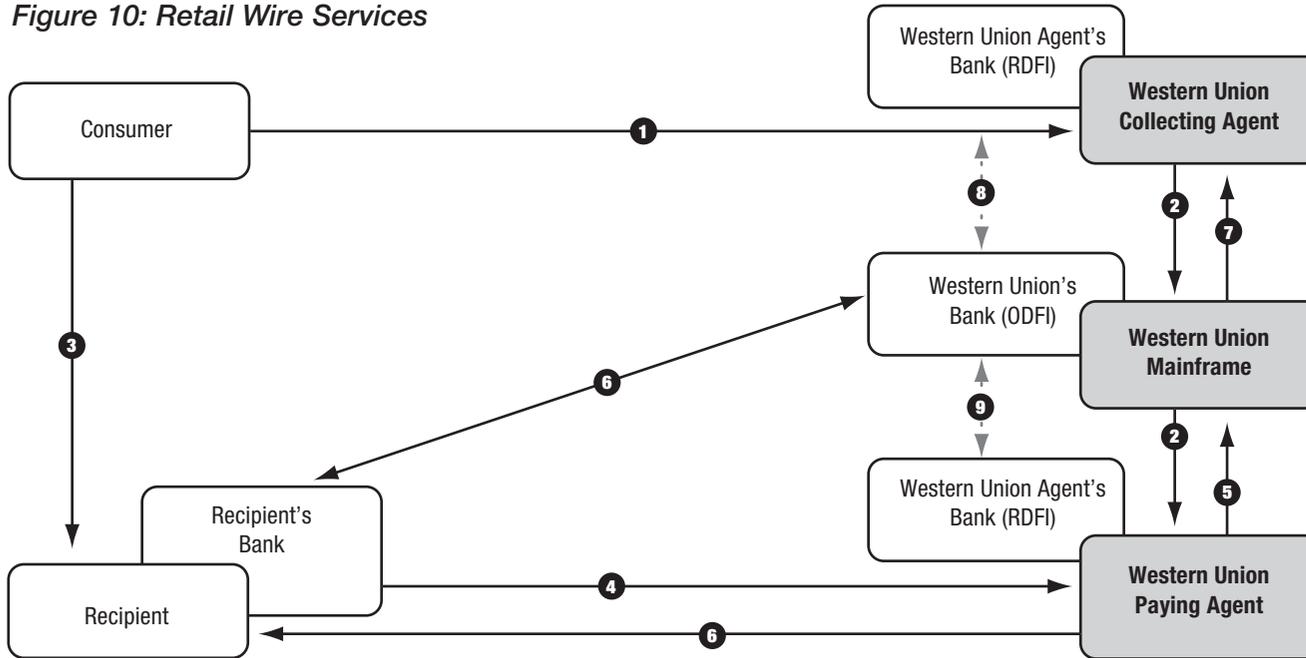
Authorization

1. At an agent location, a consumer completes a "To Send Money" form and provides it to a Western Union agent with cash to cover the transaction plus a fee. The consumer also provides the agent with information about where he/she anticipates the recipient will pick up the payment.

Processing

2. The Western Union "collecting" agent takes the money and form and enters the information from the form into a PC that interfaces with a Western Union mainframe. Approximately 15 minutes later, this information is available to whichever location becomes the "paying" agent. The collecting agent also provides the consumer with a tracking number.

3. The consumer provides the tracking number to the recipient.

4. The recipient of the funds goes to any Western Union location, completes a "To Receive Money" form, and provides it along with proper ID and other required information.

5. The agent enters the information into a PC that accesses the Western Union mainframe, and a check is automatically printed.

6. If the agent has enough cash on hand, it also cashes the check for the recipient. Depending on the amount sent and the location, some payments may be made with either a combination of cash and check or entirely by check. A sender can send any amount, but certain security compliance requirements must be met for amounts exceeding $3,000.

7. At the close of business, Western Union pulls information from its mainframe to identify how much the collecting agent has received.

8. The next day, Western Union's bank initiates an ACH debit (See Figure 5; Western Union's bank is the ODFI, and its agents' banks are the RDFIs) to withdraw the funds from the accounts of the collecting agents.

Settlement

9. At the end of the month, Western Union's bank pays the paying agents fees earned for monthly transactions.

4 Nonbank roles in emerging payments types

Introduction

Emerging payments can be classified into six broad groups: check conversion, electronic bill presentment and payment (EBPP), electronic invoice presentment and payment (EIPP), person-to-person payments (P2P), stored-value instruments, and contactless payments. This chapter presents and explains the specific steps involved in these transactions, breaking out, where appropriate, important variants of the broad payment types. As in Chapter 3, the roles played by nonbanks are emphasized.

Chart 2 shows the 19 emerging payments categories discussed in this chapter. As noted, there are six check conversion entries, three EBPP entries, one EIPP entry, three P2P entries, five stored-value entries, and one contactless payment entry. Each payment type is introduced by a brief discussion, followed by a detailed schematic.

The schematics in the figures follow the same format used in Chapter 3. In particular, nonbanks are shaded in gray; a nonbank positioned "behind" a bank, or a bank positioned behind a nonbank, denotes a possible intervening relationship; and dashed lines signify final settlement. In addition, when a given payment's final settlement is implemented through another payments mechanism, the schematic makes this clear. Two observations become apparent in surveying these schematics: There is a lot of gray, that is, significant nonbank involvement. And there are few dashed lines (final settlement) because settlement is usually effected through traditional processes, as described in Chapter 3.

Chart 2: Nonbank Roles in Emerging Payments

Check Conversion

EBPP

EIPP

P2P

Stored Value

Contactless

17.
Biller Direct

19.
Lockbox

18.
Consolidator

20.
Consolidator

23.
Western Union
MoneyZap

29.
Funding
and Use

POS

Lockbox

PayPal

Single Purpose

Multipurpose

11.
ACH

15.
Bank as
Processor

21.
Sending

24.
Sale

12.
EFT

Visa

16.
Nonbank
as Processor

22.
Receiving

25.
Redemption

ACH Infrastructure

Credit Card Infrastructure

13.
In Network

26.
EBT

27.
Visa Buxx

14.
Out of
Network

28.
Payroll
Card

Check conversion

Point of sale

Point of sale (POS) check conversion enables merchants to convert checks to electronic transactions via the ACH, EFT, or Visa networks.

The NACHA Rules allowing for POS check conversion using the ACH network went into effect in September 2000. These rules allow merchants to use the ACH system to convert consumer check payments to one-time electronic debits. According to NACHA statistics, nearly 120 million paper checks were converted to ACH items at the POS during 2002, nearly double the amount converted in 2001.

The growth in use of ACH to convert POS checks is expected to continue, especially as merchants both large and small explore the potential cost savings. For example, in 2001, Wal-Mart converted 12 million of the 1 billion checks it accepted to ACH payments (*American Banker* 2002c). Other companies, such as H&R Block, also have implemented check conversion programs.

TeleCheck, a subsidiary of FDC, is the most prominent service provider for POS check conversion via ACH. As of April 2002, TeleCheck reported having 53,000 merchants using the electronic check system, and through the first quarter of 2002, it reported handling 30 million electronic check transactions.

Plans also are underway to implement POS check conversion via EFT networks. Using EFT networks will enable instantaneous direct debits of consumer accounts at the time of conversion. NYCE Corporation is one of the participating networks.

Visa also offers a POS check conversion product that uses VisaNet. It offers its product to banks that in turn market it to merchants. Early adopters of the service include US Bank, First National Bank of Omaha, Provident Bank, and BB&T. Participating banks are allowed to "brand" the service with their own product name.

Figure 11 illustrates a POS check conversion via the ACH network. In this scenario, the consumer presents the merchant with a check, which is used solely as a source document. The merchant scans the check through a MICR reader to capture routing/transit, account, and check serial numbers, which are used to originate an ACH debit to the consumer's account. The merchant stamps the consumer's check with "VOID" and returns the check to the consumer along with a receipt for the consumer to sign as authorization for processing the transaction as an ACH item. The merchant (or its processor) submits the items to an ODFI, which originates them through the ACH network for posting to accounts at RDFIs.

Figure 12 illustrates a check conversion through an EFT network. Again, the check presented by the consumer is used solely as a source document. When the merchant scans the check through a MICR reader, the check information is converted into an electronic transaction, which is then passed to the merchant's bank or its bank's acquirer. The bank or its acquirer routes the transaction through an EFT network to the paying bank for verification and authorization. If the funds are available in the consumer's account, the consumer's (drawee) bank sends an approval to the merchant bank or its

acquirer via the EFT network and deducts the funds from the consumer's DDA in real time. The merchant is notified that the transaction is authorized, voids the consumer's check, and returns it along with a receipt for the consumer to sign as authorization for processing of the transaction as an EFT item. The transaction is settled either via the EFT or ACH network.

Figures 13 and 14 illustrate how POS check conversion occurs through VisaNet. The consumer presents the merchant with a check. The transaction is authorized using the credit card network, and if the consumer's bank is a participant in the service (Figure 13), the transaction takes place in real time. If the consumer's bank is not a participant (Figure 14), the transaction is sent to a third-party processor that uses the information captured from the check to originate an ACH debit to the consumer's account.[29]

Figure 11: Check Conversion: POS—ACH
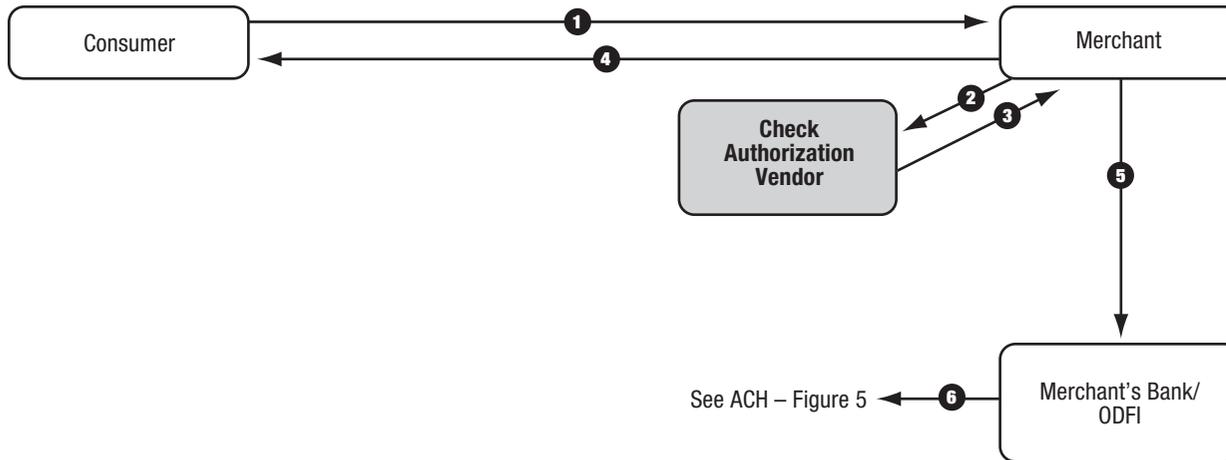
Authorization

1. The consumer writes a check for goods or services at a merchant location.
2. The merchant uses vendor-provided check authorization software to capture MICR information from the check.
3. The vendor software verifies checking account information against negative databases and completes the transaction authorization. The merchant stores and batches the MICR information for the transaction.
4. The merchant voids the check and returns it to the consumer along with a two-part receipt for the consumer's signature, which authorizes the ACH conversion. (The merchant retains one copy and the consumer retains the other.)

Processing

5. At the conclusion of the business day, or intermittently, the merchant forwards its POS MICR transaction information (see step 3) to its merchant bank, which will serve as the ODFI for the ACH transaction.
6. The balance of the steps involved in processing these payments as ACH transactions can be viewed on Figure 5, beginning with step 3. The merchant is the originator, and the consumer is the receiver.

Figure 12: Check Conversion: POS—EFT
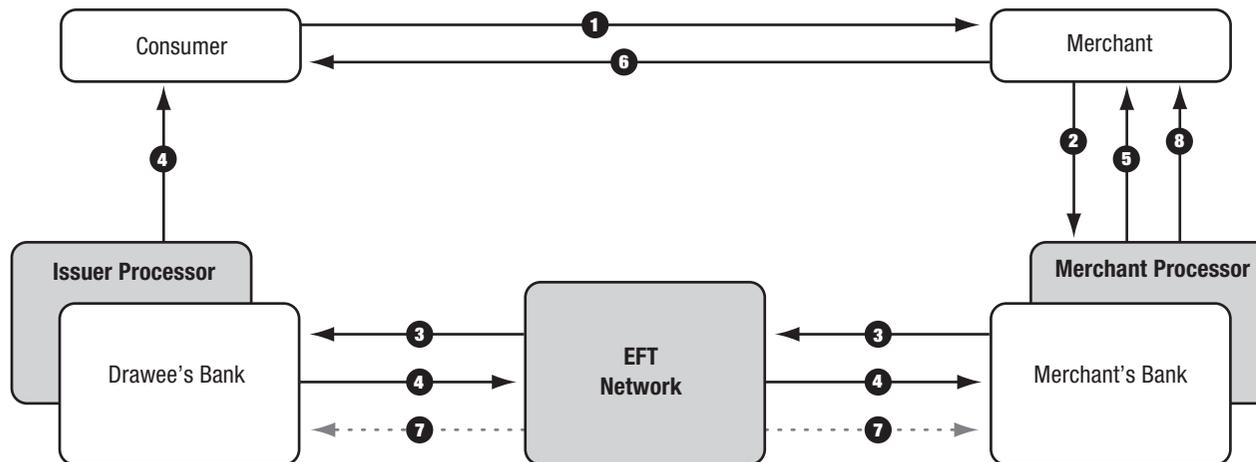
Authorization/Processing

1. The consumer writes a check for goods and/or services at a merchant location.
2. The merchant captures MICR information from the check, which is converted to an electronic transaction and passed to the merchant's bank/acquirer.
3. The merchant's bank/acquirer routes the transaction through an electronic payments network to the paying bank for verification and authorization.
4. If funds are available, the drawee's bank sends an approval message back to the merchant's bank/acquirer via the EFT network and deducts funds from the consumer's DDA in real time.
5. The merchant's bank/acquirer notifies the merchant that the transaction is authorized.
6. Upon receiving authorization, the merchant voids the check and returns it along with a receipt for signature authorizing the conversion to an EFT debit transaction.

Settlement

7. The EFT network initiates settlement of the transaction that night by ACH (see Figure 5), net settlement, or wire transfer. If settlement is initiated by ACH, the drawee's bank (or its processor) is debited and the merchant's bank (or its bank's processor) is credited by the ACH operator. The drawee's bank posts the debit to the consumer's (receiver's) account.
8. The merchant's bank (or its processor) credits the merchant's account.

Figure 13: Check Conversion: POS—Visa (in network)
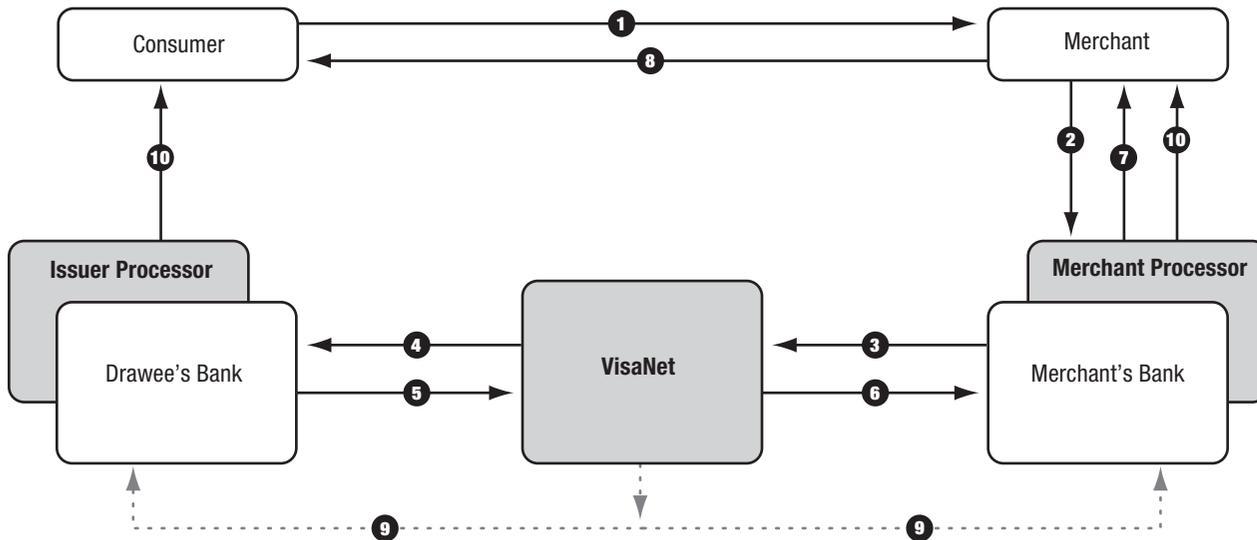
Authorization/Processing

1. The consumer writes a check for goods and/or services at a merchant location.
2. The merchant captures MICR information and passes it to its bank or potentially to its bank's processor.
   Note: The merchant may have a direct connection to VisaNet, in which case, it passes its MICR information directly to VisaNet instead of to its bank.
3. The merchant's bank or its bank's processor uses VisaNet to get transaction authorization.
4. VisaNet validates the transaction by forwarding it to the drawee's bank or its bank's processor.
5. The drawee's bank or its bank's processor performs standard authorization and communicates to VisaNet.
6. VisaNet notifies the merchant's bank or its bank's processor that the transaction is authorized. (Again, if the merchant has a direct connection to VisaNet, VisaNet could provide the transaction authorization directly to the merchant.)
7. The merchant's bank or its bank's processor notifies the merchant.
8. Upon receiving authorization, the merchant voids the consumer's check and returns it along with a two-part receipt for signature, which authorizes the conversion of the payment from check to electronic. (The merchant keeps one copy of the receipt and the consumer keeps the other.)

Settlement

9. Visa handles settlement by passing net debits and information to the drawee's bank (or its bank's processor) and net credits and information to the merchant's bank/acquirer.
10. The drawee's bank debits the consumer's DDA while the merchant's bank credits the merchant's account. If processors are involved in the transaction, then the issuer processor initiates a debit through the drawee's bank to the consumer's DDA while the merchant processor initiates a credit through the merchant's bank to the merchant's account.

Figure 14: Check Conversion: POS—Visa (out of network)
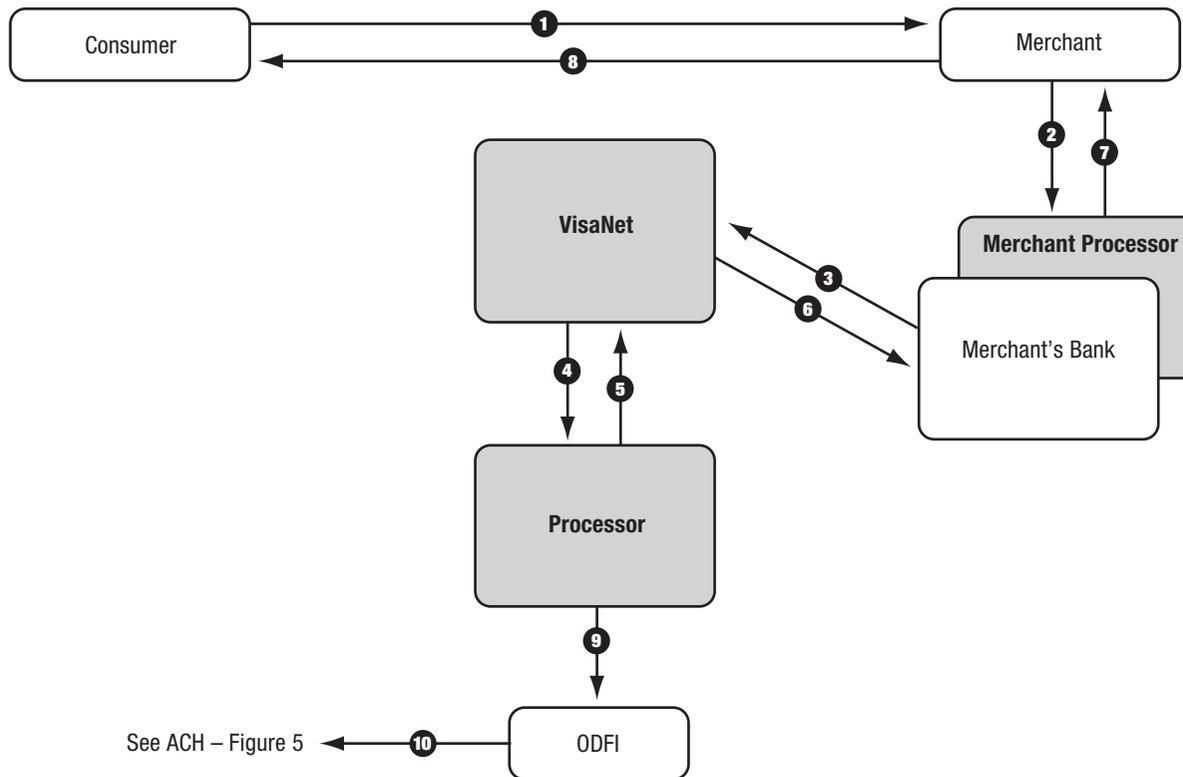
Authorization

1. The consumer writes a check for goods and/or services at a merchant location.
2. The merchant captures MICR information from the check and passes it to its bank or potentially its merchant bank's processor.

    Note: The merchant may have a direct connection to VisaNet, in which case, it would pass its MICR information directly to VisaNet instead of to its bank.

3. The merchant's bank or its bank's processor uses VisaNet to get transaction authorization.
4. VisaNet validates the transaction by forwarding it to its processor.
5. VisaNet's processor performs standard authorization and then notifies VisaNet.
6. VisaNet notifies the merchant's bank or the bank's processor that the transaction is authorized. (Again, if the merchant has a direct connection to VisaNet, VisaNet could provide the transaction authorization directly to the merchant.)
7. The merchant's bank or its bank's processor notifies the merchant.
8. Upon receiving authorization, the merchant voids the consumer's check and returns it to him/her.

Processing

9. VisaNet's processor passes the transaction information to an ODFI.
10. The ODFI handles on-us items and sends the remaining items to an ACH operator. (See Figure 5, beginning with step 4. The merchant is the originator. The consumer is the receiver.)

Lockbox

The ACH is providing new ways of electronifying payments received at remittance locations. In March 2002, the *NACHA Operating Rules* were amended to allow originators to convert checks received from consumers at a lockbox or dropbox location to ACH items. From March through December 2002, more than 17 million paper checks had been converted to accounts receivable (ARC) items. Wells Fargo, Regulus, and American Express are among those converting remittance checks.[30]

Figures 15 and 16 illustrate the transaction flows of a paper check being converted to an ARC item by a bank provider of lockbox services and a nonbank provider, respectively. In both scenarios the biller notifies its customers that checks received at the biller's lockbox or dropbox will be converted to ACH items. Upon receiving customers' checks, the service provider verifies the check against the payment stub, encodes both items, and captures MICR and other information. If the provider is a bank (Figure 15), it also handles on-us items and creates an ACH debit file. If the provider is a nonbank (Figure 16), it may create an ACH debit file if it is an originator. However, if it is not, it transmits the data to an ODFI for processing. The service provider also truncates the checks, creates an image, and destroys the originals within 14 days.[31]

Figure 15: Check Conversion: Lockbox—Bank as Processor
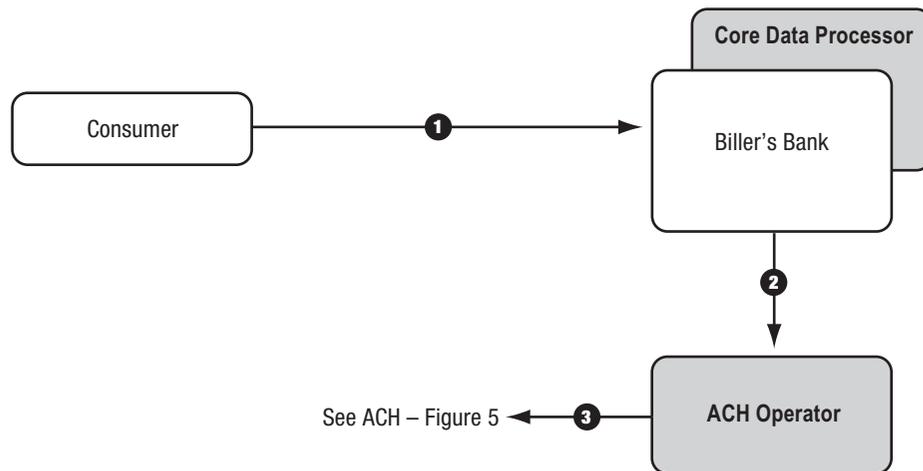
Authorization

In this scenario, the biller already has provided notification to the consumer that checks received at the biller's lockbox address will be converted to ACH items.

1. The consumer uses a check to make a bill payment and mails it to a lockbox address.

Processing

2. The biller's bank, as the lockbox service provider, verifies the check against the payment stub, encodes both items, captures MICR and other information, handles on-us items, and creates an ACH debit file. In so doing, the biller's bank serves as an ODFI and transmits the ACH file to an ACH operator. The biller's bank also truncates the checks, creates images, and destroys the original checks within 14 days.

3. The balance of the steps involved in processing these payments as ACH transactions can be viewed on Figure 5, beginning with step 4 (the consumer is the receiver).

Figure 16: Check Conversion: Lockbox—Nonbank as Processor
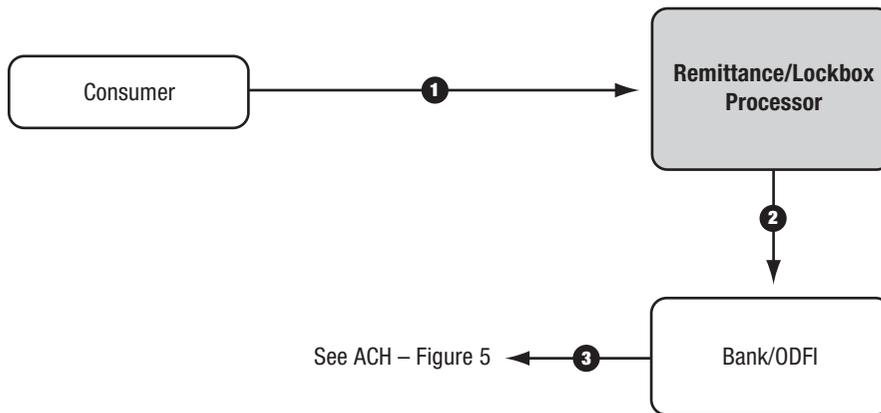
Authorization

In this scenario, the biller provides notification on the consumer's bill that a check received at the biller's lockbox address will be converted to an ACH item.

1. The consumer uses a check to make a bill payment and mails it to a lockbox address.

Processing

2. The remittance/lockbox processor verifies the check against the payment stub, encodes both items, captures MICR and other information, creates an ACH debit file, and, if it is not an originator, transmits the data to an ODFI for processing. The remittance/lockbox processor truncates the checks, creates an image, and destroys the original checks within 14 days.

3. The balance of the steps involved in processing these payments as ACH transactions can be viewed on Figure 5, beginning with step 3.

Electronic bill presentment and payment

Electronic bill presentment and payment (EBPP), the process of delivering a bill to a consumer via the Internet and allowing the consumer to pay the biller electronically, provides an alternative to the traditional process of writing checks and sending them to billers. Though relatively few bills were paid via EBPP in 2002, nonbanks have a strong presence in this market.[32] CheckFree controls about 70 percent of the EBPP market and Metavante controls about 25 percent. The remaining 5 percent is split among a number of smaller players (Global Concepts 2002).

There are essentially three EBPP models: Biller-Direct, Consolidator, and Lockbox. With the Biller-Direct method, banks play virtually no role in the process. Rather, billers that have established electronic payment capability on their Web sites notify participating customers either by paper or e-mail that a bill is due for payment. By visiting the biller's Web site, those customers can view billing information and make payments directly to the biller using a credit card or DDA.

The Consolidator method of EBPP is based on agreements the consolidator establishes with a variety of billers to provide presentment and payment capabilities to the billers' customers. Consolidators may be financial institutions, such as banks and insurance companies, Internet portals, such as MSN and Yahoo, or other private sector entities, such as CheckFree, Metavante, or Princeton eCom. Acting as a "service bureau," the consolidator collects billing data from billers, delivers the data to customers, and collects payment instructions from customers online.

The third EBPP method, Consumer Lockbox, provides a means for consumers to receive all their bills electronically by enrolling with and rerouting their bills to a lockbox provider such as PayTrust (Metavante). When paper bills are received at the lockbox, they are scanned and converted to electronic statements. The electronic statements are then presented to consumers to review. As with the Biller-Direct method, banks play virtually no role in the process.

The biller's preferred role in EBPP determines which of the three models it opts to employ.

Figure 17 outlines how a payment is effected in the Biller-Direct EBPP model. With this model the biller, perhaps with the assistance of a bill service provider, presents billing information directly to the customer and enables him/her to make payment electronically. If the customer makes payment via a credit card, the biller's bank may work with a nonbank service provider like MasterCard RPPS or Visa ePay to collect the funds for the biller. Or, if the customer makes payment via a DDA, the biller's bank may work with an ACH operator to collect the funds on the biller's behalf.

Figure 18 outlines how a payment is effected in the Consolidator EBPP model. With this model, nonbanks are more involved. Though a bank may operate the Web site at which the consumer views and pays bills, the Web site consolidator also could be a nonbank. In addition, nonbanks are often the providers of the software that supports the consolidator's Web site and ultimately may be involved in processing the bill payment information before instructing a bank to initiate payment to the biller. On the payment side, nonbanks again have a presence. Dependent on the consolidator's agreement with the biller, a bank may initiate payment to the biller through a nonbank service provider like MasterCard RPPS or Visa ePay, through an ACH operator, by wire, or by check (accompanied by a list of consumer payors and amounts).

Figure 19 outlines how a payment is effected in the Lockbox EBPP model. Nonbanks, specifically lockbox service providers, are present at the point of payment initiation. The service provider is the actual recipient of the consumer's paper bill and presents that bill information at its Web site for the consumer's review. The service provider then either works through its bank or a contracted processor to collect the funds on the biller's behalf. Again, the method of payment depends on the lockbox provider's agreements with its participating billers. A bank may initiate payment to the biller through a nonbank service provider like MasterCard RPPS or Visa ePay, through an ACH operator, by wire, or by check (accompanied by a list of consumer payors and amounts).

Figure 17: EBPP: Biller Direct
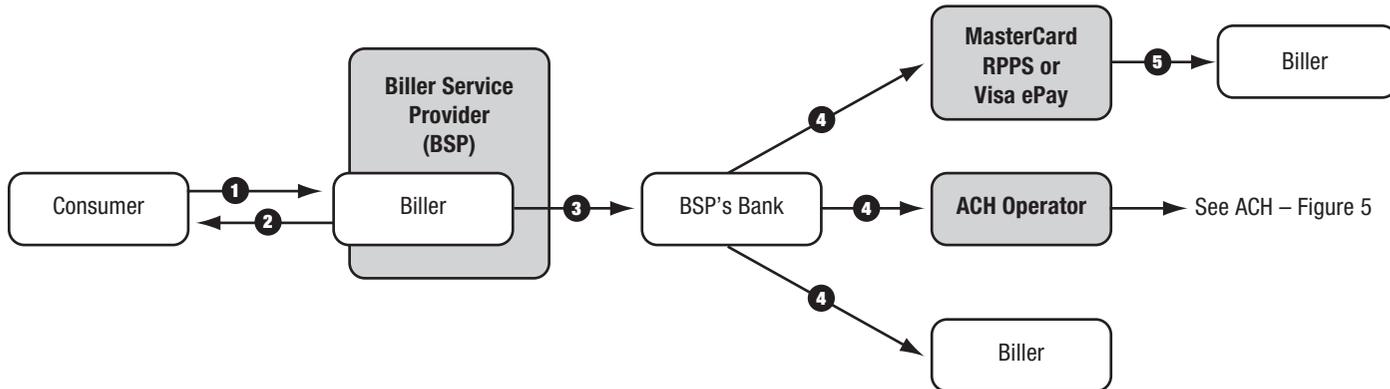
Authorization

1. A consumer visits a biller's Web site to pay a bill. The biller authenticates the consumer and obtains appropriate authorization.

Processing

2. The consumer is presented with a payment screen to pay bills. The consumer completes name, address, payment type and amount, and account number fields. (If the consumer has used the biller's electronic billing function before, the biller may retain name and address information and may populate some or all of these fields.) The consumer receives an acknowledgement that the bill has been paid. The biller may require a consumer to pay a bill before the actual due date (e.g., five days before) to ensure adequate time for posting.

3. The biller establishes a daily cutoff, after which, the end-of-day cycle is run. The biller (or the biller's service provider) sends a data file to its bank.

4. Based on the payment method selected by the consumer, the processor instructs its bank to initiate payment—through MasterCard RPPS or Visa ePay, or by ACH (See Figure 5; the BSP's bank is the ODFI, while the consumer receives an ACH debit and the biller receives an ACH credit), wire transfer, or check. Billers receive the payments and an electronic data file with accompanying information. A paper check and list of payers are created for billers who receive a check payment.

Settlement

Settlement depends on the method(s) by which the biller has chosen to receive payments. Check, ACH, and wire transfer payments settle as described elsewhere.

5. If the payment is made through MasterCard RPPS or Visa ePay, it is processed through the respective channels and delivered to the biller.

Figure 18: EBPP: Consolidator
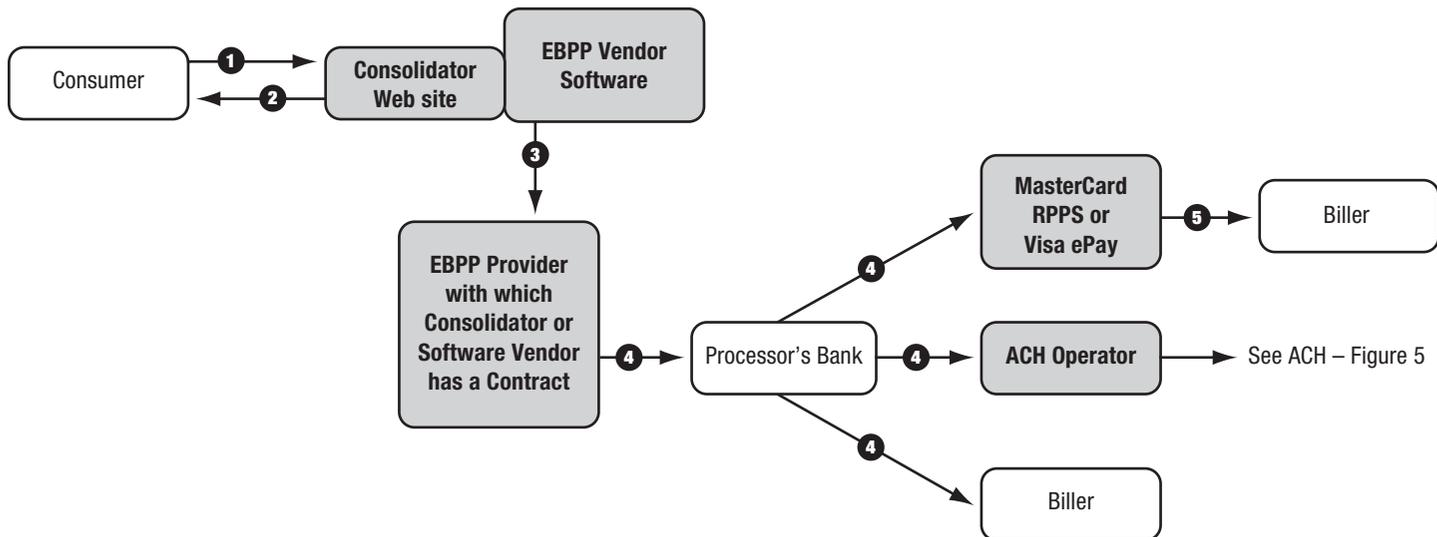
Authorization

1. A consumer visits a consolidator's Web site where all of his/her bills are gathered into one place for viewing and payment. The consolidator may or may not be a bank. The consolidator authenticates the consumer and obtains authorization for the payment.

Processing

2. The consumer is presented with a payment screen to pay bills. (The consumer may not be viewing his/her bill online in this model.) The consumer completes name, address, payment amount, and account number fields. If the consumer has an existing relationship with the consolidator, the consolidator may keep name and address information on file and populate this information for the consumer. The consumer receives acknowledgment that the bill has been paid. The consolidator may require consumers to pay bills before the biller's actual due date given on the bill (e.g., five days before) to ensure timely posting.

3. The consolidator establishes a daily cutoff, after which, the end-of-day cycle is run. The consolidator sends a data file to the processor with whom it maintains a contract (e.g., Princeton eCom, CheckFree).
   Note: It is possible that the software vendor also is the EBPP provider, thus step 3 would take place "internally" through communication between the software and provider.

4. Based on agreements between the processor and the billers who are to receive payment, the processor instructs its bank to initiate payment through MasterCard RPPS or Visa ePay, or by ACH (see Figure 5), wire transfer, or check. Billers receive the payments and an electronic data file with accompanying information. A paper check and list of payers are created for billers who receive a check payment.

Settlement

Settlement is dependent on the method(s) by which the biller has chosen to receive payments. Check, ACH, and wire transfer payments settle as described elsewhere.

5. If the payment is made through MasterCard RPPS or Visa ePay, it is processed through the respective channels and delivered to the biller.

Figure 19: EBPP: Lockbox
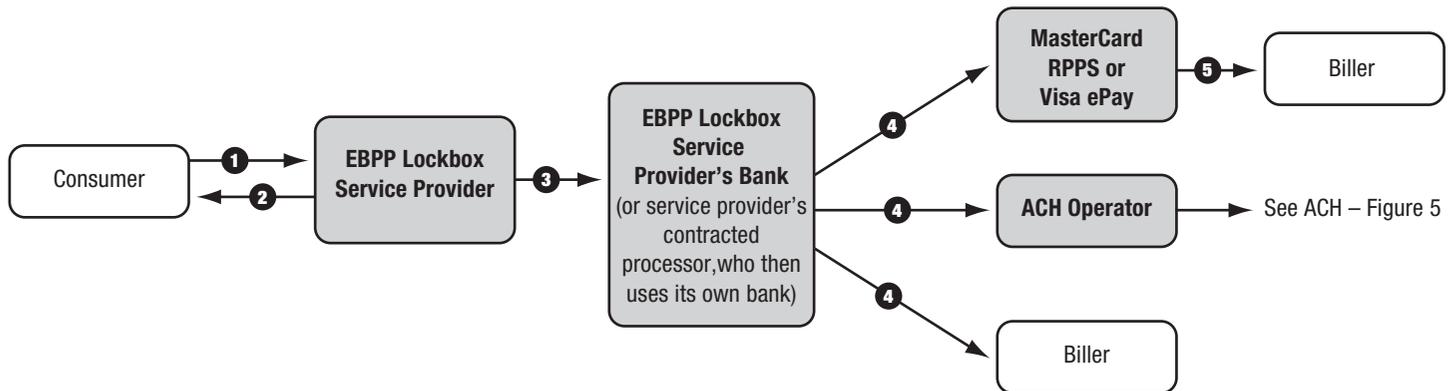
Authorization

1. Consumers can reroute paper bills to an electronic bill payment lockbox service provider such as PayTrust (Metavante). When paper bills are received at the lockbox, they are scanned and converted to electronic statements. These electronic statements then are presented to the consumer for review. The consumer visits the lockbox service provider's Web site to review the statements. The lockbox service provider authenticates the consumer. The consumer provides payment instructions to the EBPP lockbox service provider. The provider may require consumers to pay bills before the biller's actual due date given on the bill (e.g., five days before) to ensure timely posting.

Processing

2. The consumer receives acknowledgment from the EBPP lockbox service provider that the bill has been paid.

3. The provider establishes a daily cutoff, after which, the end-of-day cycle is run. The provider sends a data file to its bank or possibly to a third-party processor with whom it maintains a contract (e.g., Princeton eCom, CheckFree).

4. Based on agreements between the processor and the billers who are to receive payment, the processor instructs its bank to initiate payment through MasterCard RPPS or Visa ePay, by ACH (see Figure 5), wire transfer, or check. Billers receive the payments and an electronic data file with accompanying information. A paper check and list of payers are created for billers who receive a check payment.

Settlement

Settlement is dependent on the method(s) by which the biller has chosen to receive payments. Check, ACH, and wire transfer payments settle as described elsewhere.

5. If the payment is made through MasterCard RPPS or Visa ePay, it is processed through the respective channels and delivered to the biller.

Electronic invoice presentment and payment

Just as EBPP provides consumers with the opportunity to view and/or pay bills online, electronic invoice presentment and payment (EIPP) provides businesses with the same opportunity. Thus it also is referred to as B2B (Business-to-Business) EBPP.

There are three models for EIPP—Seller-Direct, Consolidator, and Buyer-Direct. The Seller-Direct and Buyer-Direct models are straightforward models in which the buyer and seller have set up some arrangement where invoices are presented and can be paid online. Some, or even all of the steps in between (reconciling, dispute resolution, etc.), take place electronically. In the Consolidator model of EIPP, a nonbank participant may provide a Web site accessible to both the buyer and seller.

One of the primary players in offering EIPP services is Bottomline Technologies, which offers its NetTransact service. Through this service companies may provide electronic invoices and receive and process electronic payments. Bottomline's service may be hosted by a bank, a corporation, or outsourced.

Figure 20 illustrates the flow of EIPP in the Consolidator model. Using the consolidator's Web site, the seller can post electronic invoices for buyers. Buyers sign on to retrieve invoices and then review, modify as needed, and approve them for payment. Typically the buyer controls the timing of the payment, which may be made via the ACH, credit card, wire transfer, or check.

Figure 20: EIPP: Consolidator

See ACH – Figure 5
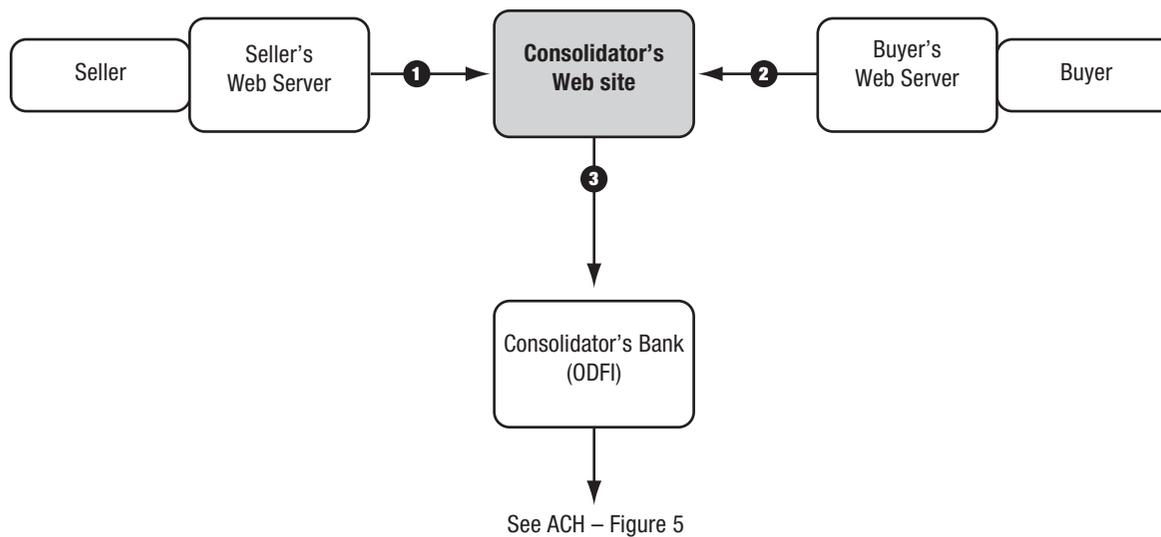
Authorization

1. In the Consolidator model, sellers post their invoices to the browser-accessed Web site of a consolidator, where buyers can view them. Any type of authorization scheme in place would be specific to the systems and/or agreements among these three parties.

Processing

2. The buyer's personnel views the invoices online, modifies them if necessary, and approves them for payment, all from one integrated system.
3. The consolidator, through its ODFI, initiates an ACH debit to the buyer's account and a credit to the seller's account for payment of the invoice. (See Figure 5; the consolidator is the originator, the buyer is the receiver of an ACH debit, and the seller is the receiver of an ACH credit.) The consolidator also may provide payment capabilities via credit card, wire transfer, or check.

Person-to-person

The origin of person-to-person (P2P) payment services is related to the introduction of online auction Web sites, such as eBay.com. P2P payment services were pioneered by nonbanks to provide an expeditious method of "settling" online auction transactions, and on the surface they looked new. However, as is the case with many types of emerging payments, they combine newer technologies (Web and e-mail) with traditional payments infrastructures (bank accounts, debit and credit card networks, ACH, and potentially EFT networks.)[33]

The most prominent provider of P2P services is a nonbank, PayPal. Established in 1999, PayPal's network builds on the existing financial infrastructure of bank accounts and credit cards. In so doing, PayPal enables consumers to make payments to one another and to businesses by using a Visa, MasterCard, Discover, or American Express card, a debit card, a checking account, or funds held in a PayPal stored-value account. Today, PayPal has more than 20 million registered users, including more than 3 million business accounts.[34] PayPal's account base is reportedly growing by an average of 28,000 accounts per day. PayPal is available to users in 38 countries, and by June 30, 2002, more than $3 billion had been sent through the PayPal network.

Bank providers of P2P services later emerged (Wells Fargo—Billpoint, BankOne—eMoneyMail, Citibank—c2it), but they have each ceased offering these services.

Another variant of P2P services is an online check offering from TeleCheck, a First Data company, called Western Union MoneyZap. The MoneyZap service enables consumers to use information from their checking accounts to facilitate online purchases. However, funds cannot be transferred internationally, and transactions must be in U.S. dollars drawn from U.S.-based banks. While discussed as a P2P service, this service is consumer-to-business and is aimed at enabling merchants to tap into the buying power of the 12 million U.S. households that do not have credit cards.

A P2P service that uses the EFT network also is on the horizon. The NYCE Corporation and CertaPay are promoting technology that will let people pay anyone from a multitude of devices, including the Internet, and provide immediate availability of funds by settling through the NYCE EFT network infrastructure. This technology requires that the person making the payment know the ATM or debit card number of the person receiving the payment, and both people must have accounts at banks that are members of NYCE. NYCE is currently piloting this technology.

Figure 21 outlines how a P2P payment might be initiated through the PayPal network. Payment initiators have the option of using a checking account, a PayPal money market account, idle PayPal funds held in an FDIC-insured bank account, or a Visa, MasterCard, Discover, or American Express card to effect their payment. If the payment is initiated using a checking account or a PayPal money market account, the transaction will be processed via ACH. If the payment is initiated via credit card, it will be processed in a manner consistent with "card not present" transactions (refer to Figure 8). And, if a payment is initiated by using idle funds, a general ledger account entry results.

Figure 22 outlines how the recipient of a PayPal payment may opt to receive funds. If the recipient has or opens a PayPal Personal Account, several options are available. The money can be left in the PayPal account to be used for future payments, a PayPal money market account can be opened and the funds moved to it, the funds can be deposited in an individual checking account, or a check can be mailed. If the money is left in a PayPal account, it will immediately be moved to a consumer account at an FDIC-insured bank. If either the money market option or the deposit option is selected, the transaction is effected through ACH. With a Premier or Business account, the recipient has the additional option of accessing the funds at POS locations and ATMs with the PayPal ATM/debit card. Additionally, the recipient can receive payments initiated by credit card.[35]

Figure 23 outlines a payment made through the Western Union MoneyZap service. Each of these payments is initiated via information from a checking account and ultimately is processed as an ACH transaction. Account and personal information are verified against third-party and proprietary databases. The ultimate payment to the recipient is effected through ACH.

Figure 21: P2P: PayPal—Sending
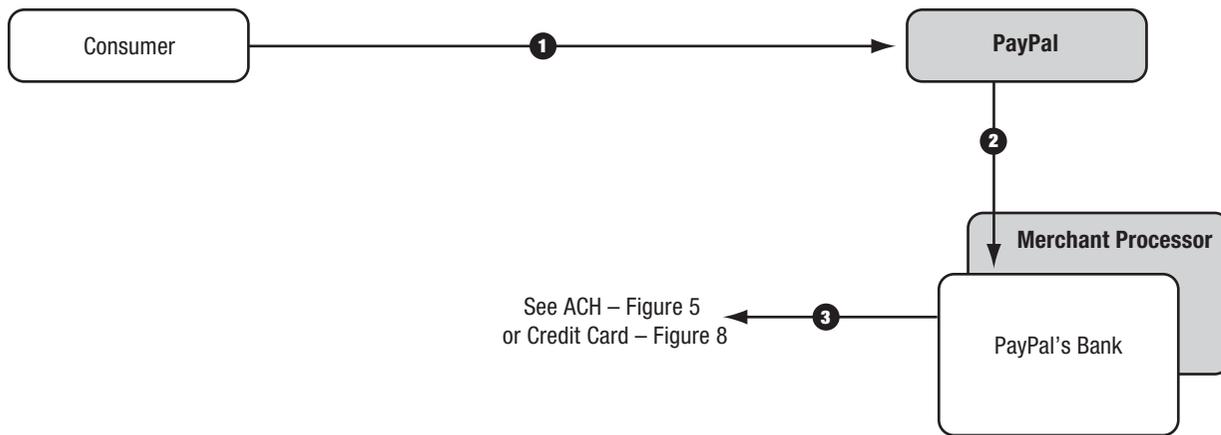
Authorization

1. The consumer uses the Internet or e-mail and checking account information, a credit card, or PayPal account stored value to initiate payment to a merchant or another individual via the PayPal service. The PayPal stored value can take one of two forms—the PayPal money market account or funds the customer has left in his/her PayPal account, which is held at an FDIC-insured bank.

2. PayPal sends encrypted transaction data either to its bank or its bank's processor.

Processing

3. The back-office processing of these transactions depends on the method of payment selected by the consumer.

   • If the payment is being initiated from the consumer's checking account, PayPal's bank or its bank's processor handles the resulting transaction. See Figure 5 to view the balance of the steps involved in processing the payment. PayPal's bank acts as the ODFI, and the consumer is the receiver of the ACH transaction.

   • If the payment is being initiated via a consumer's credit card, PayPal's bank or its bank's core data processor or check outsourcer processes the transaction. See Figure 8 beginning with step 2 to view the balance of the steps involved in processing the payment.

   • If the payment is being initiated via a consumer's PayPal account stored-value funds, the funds are swept either from the consumer's money market fund account or from an account at an FDIC-insured bank to pay for the purchase.

Figure 22: P2P: PayPal—Receiving
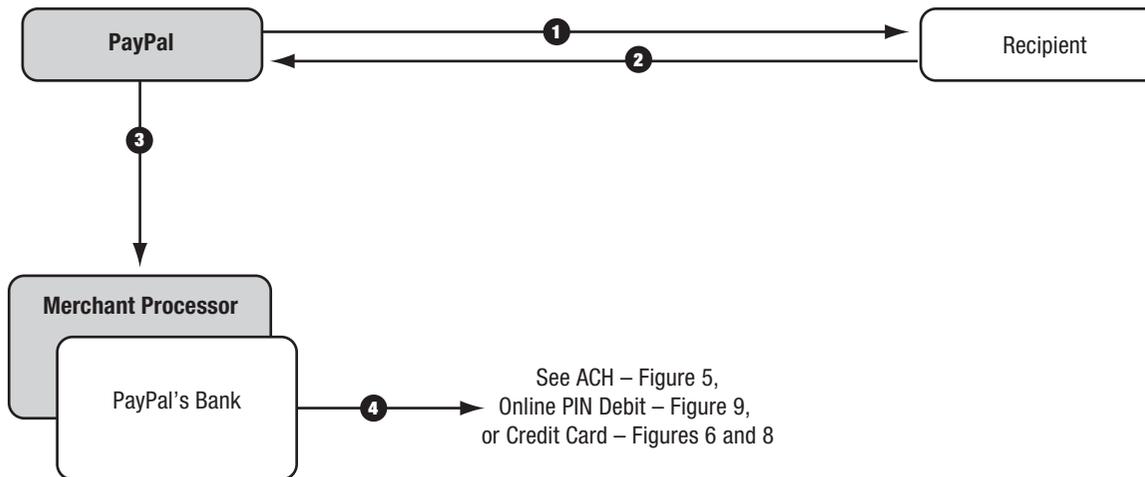
Authorization

1. The recipient of the payment receives notification from PayPal that someone has sent him/her a payment.
   Note: Once received by PayPal, the funds are immediately credited to the customer's stored-value account, which is either a PayPal money market account or a pooled account at an FDIC-insured bank.

2. When the recipient chooses, he/she informs PayPal of how he/she would like to receive the funds.

3. PayPal notifies its bank of the customer's request.

Processing

4. The processing of the payment transaction depends on the method selected by the recipient.

   • If the recipient requests a check, PayPal contacts its bank and provides payment instructions so that a check can be cut and mailed.

   • If the recipient requests that the funds be deposited to an individual bank account, the transaction is handled via an ACH transfer through Wells Fargo. See Figure 5 to view the balance of the steps involved in processing the payment. Wells Fargo serves as PayPal's ODFI, and the recipient becomes the receiver in the ACH transaction.

   • If the recipient is a holder of a PayPal/MasterCard debit/ATM card, he/she may use that card at a POS location or at an Internet vendor. See Figure 6 for offline debit POS transactions, Figure 9 for the online debit POS scenario, or Figure 8 for purchases made from Internet vendors.

In addition, the recipients may send payment to other PayPal customers, funded from their PayPal stored value. They also may make a bill payment, which is processed through a third-party provider (MasterCard RPPS).

Figure 23: P2P: Western Union MoneyZap
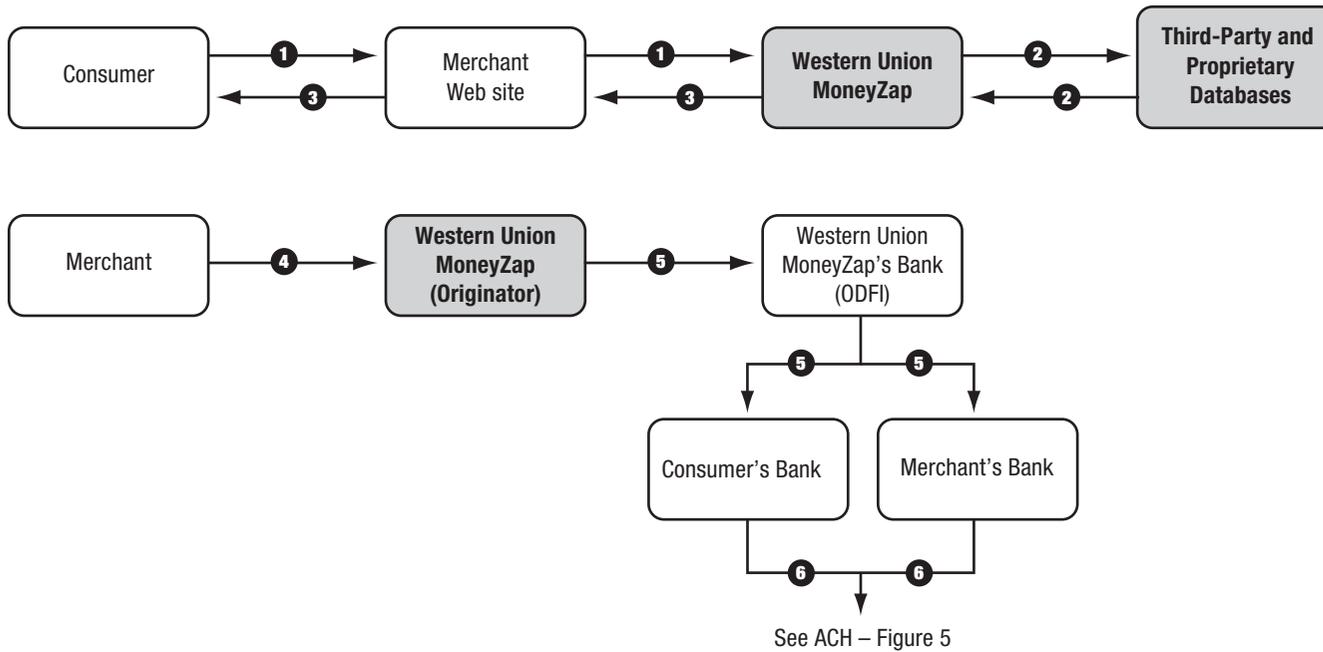
Authorization

1. A consumer initiates payment to a merchant by selecting the MoneyZap payment option during checkout and entering his/her checking account information into a pop-up window hosted by Western Union.
2. Using the consumer's personal and financial information, Western Union verifies the identity of the consumer and the validity of his/her account information through the use of third-party and proprietary software.
3. If approved, the consumer is presented with an online receipt.

Processing

4. The merchant submits a request to Western Union to initiate funds movement. These entries include full and partial claims, full and partial refunds, and recurring payment transfers for which a merchant has authorization.
5. Western Union instructs its ODFI to initiate an ACH debit from the consumer's designated checking account and an ACH credit to the merchant's account.
6. See Figure 5 beginning with step 3.

Stored value

Stored-value cards are access devices used to debit funds from a nonchecking account and are funded through tradi-
tional means such as checking accounts, ACH funds transfer, credit cards, debit cards, or cash.

Stored-value cards come in many forms, including gift cards, EBT cards, payroll cards, and prepaid cards and are either
single purpose (closed loop) or multipurpose (open loop). Single-purpose cards, such as gift cards, are good only at a
specific retailer. In contrast, multipurpose cards, like EBT cards, payroll cards, and some prepaid cards, can be used in
multiple locations.

Gift cards are typically offered by retailers as a replacement for paper-based gift certificates, as well as by some banks.
With gift cards, customers are given a card with a magnetic stripe in exchange for money received, merchandise returned,
or other considerations. The card represents a dollar value that the consumer either can use or give to another individual.
The record of the balance on the card is maintained on a centralized stored-value card database. In 2001, consumers
redeemed more than 200 million gift cards. That year, Stored Value Systems, one of the providers of stored-value cards,
reported processing 45 percent of all gift cards used in the United States (Stored Value Systems 2002).

EBT cards enable recipients of government benefits to authorize transfer of those benefits from a Federal government
account to a participating retailer account to pay for products received. The EBT card is similar to a debit card and is
issued to a recipient along with an assigned or chosen PIN. EBT systems typically use magnetic stripe technology;
however, smart card technology is a little-used option. Those systems that use magnetic stripe technology for online
authorizations use the same EFT technology that many stores use for their debit card payments. Companies like eFunds
and Lockheed Martin conducted more than 530 million EBT transactions in 2000 (Global Concepts 2002).

Prepaid cards like Visa Buxx are another form of stored-value cards. The Visa Buxx card is typically purchased by one
consumer (usually a parent) on behalf of another (usually a teen) and is accepted at more than 23 million locations world-
wide, including online merchants. In addition, a PIN can be requested when the card is ordered, making ATMs accessible
with the Visa Buxx card as well. When a purchase is made with the Visa Buxx card, the amount is deducted from the card
balance. And, when the balance is low, the card can be reloaded.

An estimated 25 million U.S. wage earners do not have bank accounts (Concord 2002). The lack of a banking relationship
means that these workers most often are paid by paper check. Payroll cards are targeted to unbanked or underbanked
workers as a replacement for paper checks. Payroll cards can be established in either a reloadable card for ongoing payroll
payments or as a single-load, instant-issue card for final pay, payroll adjustments, or other one-time payments. The reload-
able card typically is a Visa or MasterCard account, while the single-load card typically is a PIN-based debit card. Both are
prepaid card accounts with the card being assigned to an employee and funded by the employer through either direct
deposit or a standard ACH batch file. The Visa or MasterCard account is personalized with the employee's name and can
be used—up to the available funds—wherever Visa or MasterCard is accepted worldwide. In addition, a PIN can be added,
which would provide cash-back service at most retailers as well as ATM access to the available funds.

Figure 24 outlines how a consumer might purchase a single-purpose, stored-value card. Consumers have the option of using a check, credit card, or debit card to make a gift card purchase. Additionally, it is possible that a consumer's check can be converted at the POS to an ACH transaction. Upon successful completion of purchase authorization, the merchant swipes the gift card through its POS reader to activate it with its stored-value card issuer. The card issuer also adds the sale of the card to its information database. This transaction looks like a normal sale but results in a credit to the merchant's "gift card" general ledger account.

Figure 25 outlines how a consumer redeems a single-purpose, stored-value card. In this instance, a consumer uses a gift card to make a purchase. When the card is presented to the merchant, the merchant swipes the card through its POS reader, through which the transaction details are forwarded to the merchant's stored-value card issuer. The issuer searches its database for the card number and sends transaction authorization to the merchant.[36] From the merchant's perspective, the redemption of the card is handled on its books with a debit to the merchant's general ledger "gift card" account.

Figure 26 outlines how a recipient of Federal benefits uses their EBT card at an authorized merchant to make a purchase. The card is swiped through a POS terminal and the cardholder enters his/her PIN. The transaction information then is forwarded to an EBT provider that verifies the PIN and the account balance and sends transaction authorization back to the merchant. The EBT provider ultimately deducts the amount of purchase from the cardholder's existing balance, and, if the EBT provider is an ACH originator, it initiates an ACH credit to the merchant's account at its bank. If the provider is not an originator, it provides information to an ODFI, which does so on the provider's behalf.[37]

Figure 27 outlines how a consumer might fund a Visa Buxx card and, subsequently, how that card might then be used. Consumers have the option of using information from a DDA to initiate an ACH transaction, a credit card, or a debit card to fund a Visa Buxx card purchase. Once the transaction is approved, a Visa Buxx card is issued in the name requested by the consumer. The designated user of the Visa Buxx card can use the card to make purchases at both physical and Internet locations or sites. The merchant processes the card just as they would any other POS or Internet transaction.

Figure 28 outlines how an employer might fund a payroll card and how its employee might then use the card. Working with a stored-value card issuer, a bank markets the payroll card program to employers. Once an employer enrolls, either the employer or the bank provides the employee with a payroll card. Before the pay date, the employer transmits an electronic file to the bank indicating how much to credit to the employee's payroll card account. If the bank is not the employer's "primary" bank, it acts as an ODFI and originates a file to the employer's bank (the RDFI). When the funds are available, depending on the type of card issued, the employee may use the payroll card at physical and/or Internet merchant locations and sites and as either a PIN-based and/or signature debit card.

Figure 24: Stored Value: Single Purpose—Sale

See
Traditional Check – Figures 1 and 2,
Credit Card – Figures 6, 7, and 8,
PIN-based Debit – Figure 9, or
POS Check Conversion – Figures 11 and 12
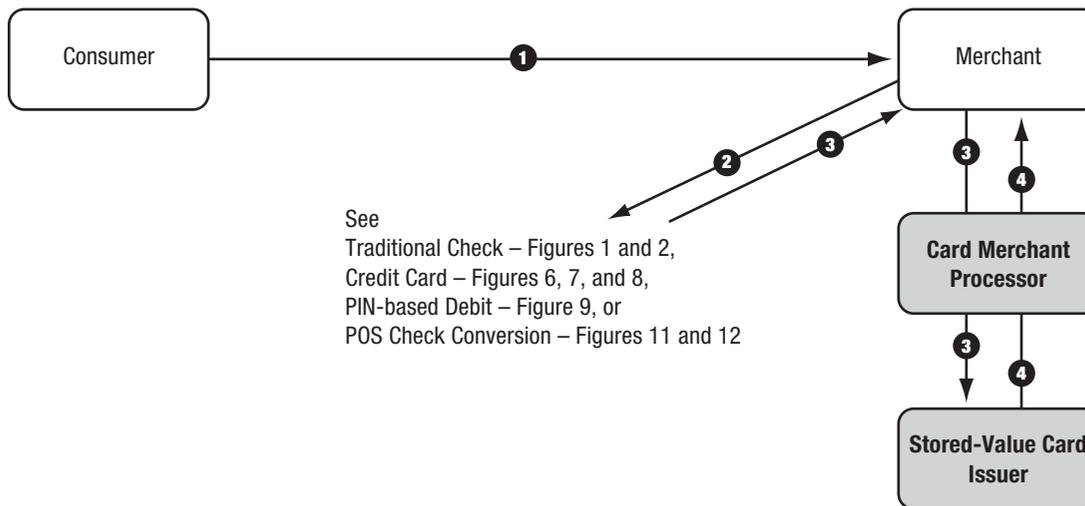
Authorization

1. The consumer purchases a gift card at a merchant location.

Processing

2. The sale of the gift card is processed based on the method of payment (check, credit card, debit card, or POS check conversion) and recorded as a gift card sale (credit) on the merchant's general ledger.

3. Upon successful completion of the purchase transaction, the merchant swipes the gift card through its POS reader, and the transaction travels through the merchant's existing internal network or credit card authorization interface to its gift card service provider.

4. The service provider adds the sale of the gift card to its information databases, which both records the sale and activates the card for use.

Note: The value the service provider adds for the merchant is the ability to issue gift cards and various reporting features showing sales and redemptions that assist the merchant with reconciling its gift card transactions on its general ledger. The service provider is not involved in the actual processing of the payment portion of the transaction.

Figure 25: Stored Value: Single Purpose—Redemption

```
┌──────────────┐                                                    ┌──────────────┐
│              │                              ①                     │              │
│   Consumer   │ ─────────────────────────────────────────────────▶│   Merchant   │
│              │                                                    │              │
└──────────────┘                                                    └──────────────┘
                                                                       │    ▲
                                                                    ②  │    │ ③
                                                                       ▼    │
                                                                ┌──────────────────┐
                                                                │  Card Merchant   │
                                                                │    Processor     │
                                                                └──────────────────┘
                                                                    │    ▲
                                                                 ②  │    │ ③
                                                                    ▼    │
                                                                ┌──────────────────┐
                                                                │ Stored-Value Card│
                                                                │      Issuer      │
                                                                └──────────────────┘
```
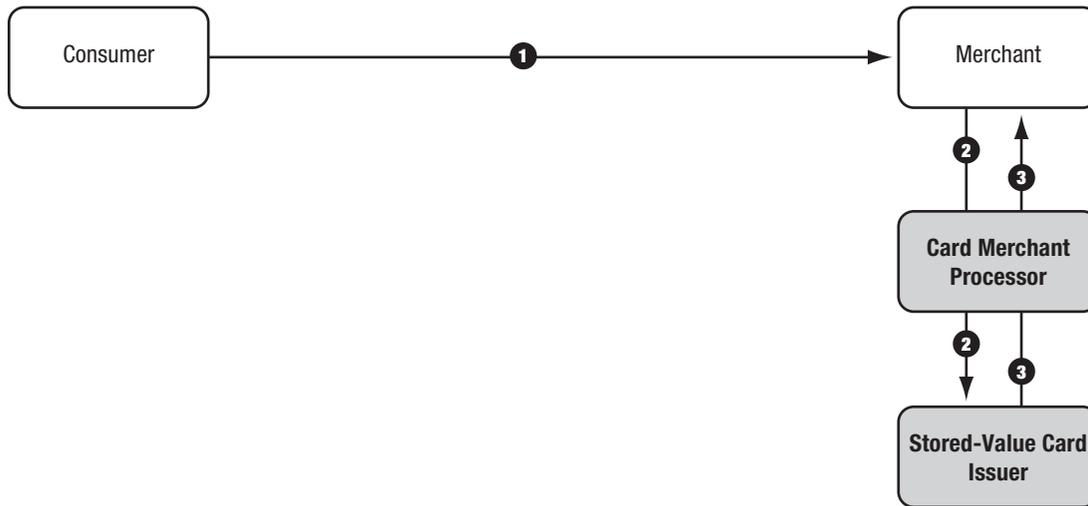
Authorization

1. The consumer makes a purchase and presents a gift card as payment at the POS.

2. The merchant swipes the gift card through its POS reader, and the transaction travels through the merchant's existing internal network or credit card authorization interface and is forwarded to the service provider.

3. The service provider searches its databases for the gift card account number and sends a response (authorization) to the merchant. Included in that response is the amount available on the gift card. (It is possible that the gift card balance is not sufficient for the entire purchase and that the transaction will require some additional form of payment, but for simplicity's sake, this example assumes that the gift card covers the purchase amount.)

Processing

From the merchant's perspective, the redemption of the gift card is handled on its books with a debit to the merchant's general ledger "gift card" account.

Note: The value the service provider adds for the merchant is assisting with various reporting features showing sales and redemptions that facilitate the merchant's reconcilement process.

Figure 26: Stored Value: Multipurpose—ACH Infrastructure/EBT
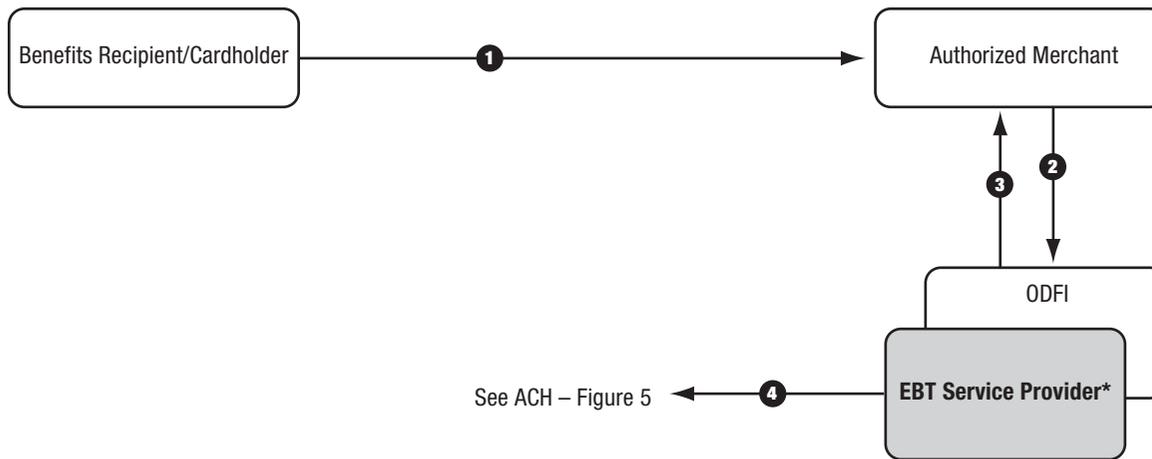
Authorization

1. Using a plastic card similar to a debit card, the benefits recipient initiates a grocery purchase by running his/her benefits card though an electronic POS terminal and entering a PIN number to access his/her food stamp account.
2. The benefits recipient's information is forwarded to an EBT service provider.
3. The provider verifies the PIN and the account balance and sends an authorization or denial back to the merchant.

Processing

4. The EBT service provider deducts the amount of the purchase from the benefits recipient's existing balance. Either the EBT service provider (if it has ODFI capabilities) or its ODFI initiates a credit to the merchant's account at its bank via either the ACH or EFT. For ACH, see Figure 5 beginning with step 3. For processing these payments through the EFT, see Hayashi and others, 2003.

Note: Transaction processors typically are responsible for issuing cards in addition to authorizing transactions and maintaining benefits recipients' accounts.

Figure 27: Stored Value: Multipurpose—Credit Card Infrastructure/Visa Buxx
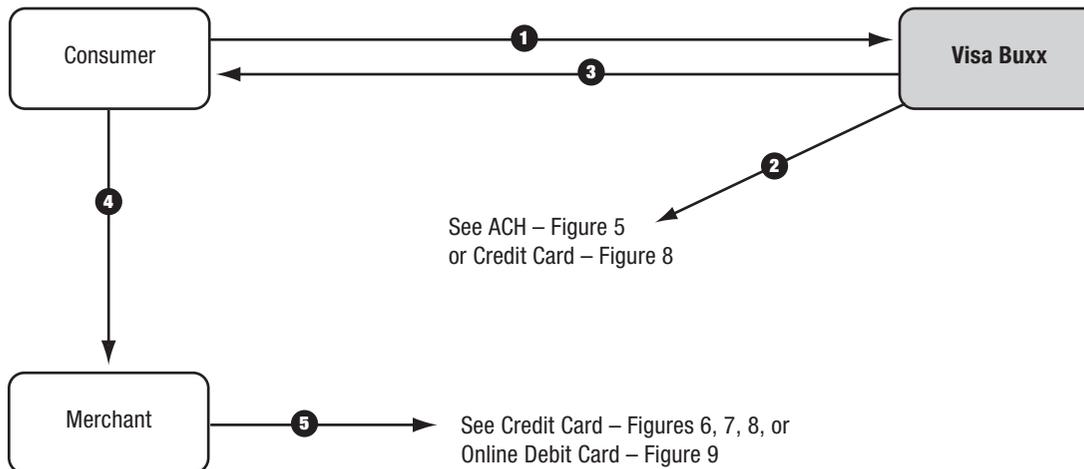
Authorization

1. The consumer purchases a Visa Buxx card by going to the Visa Buxx Web site.

Processing

2. The consumer prepays a starting dollar amount by using an ACH transaction, a credit card, or a debit card. If an ACH transaction is used to fund the card, see Figure 5 beginning with step 2. (Visa is the originator of the transaction, and the consumer is the receiver.) If a credit card or debit card is used to fund the card, see Figure 8 beginning with step 3.

3. Once the transaction is approved, a Visa Buxx card is issued to the consumer.

4. The consumer uses a Visa Buxx card to make a purchase at either a physical or Internet merchant location or site.

5. The merchant processes the card as it would any other credit card transaction. Refer to Figure 6 or 7, step 2 if the purchase is a "card-present" transaction; Figure 8, step 2 if the purchase is made via the Internet or telephone; or Figure 9, step 2 if the transaction is PIN-based.

Figure 28: Stored Value: Multipurpose—Credit Card Infrastructure/Payroll Card
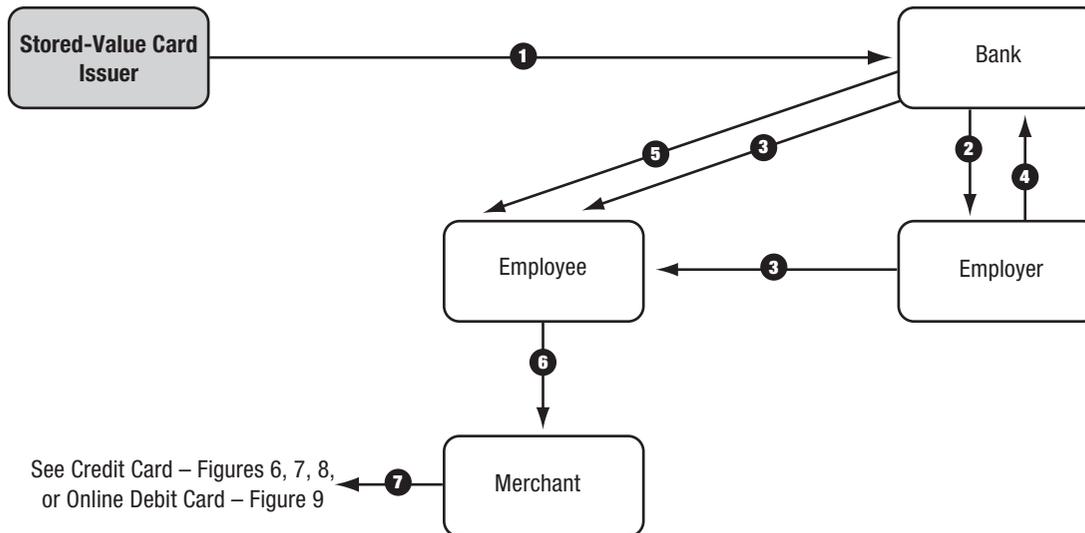
Authorization

1. The service provider works with a bank to establish a payroll card program. The provider handles things such as card issuing and transaction processing, customer service, and program administration.

2. The bank then "markets" the payroll card service to its business clients.

3. Once an employer enrolls, either the bank mails the payroll cards to the employees the business has enrolled or the employer provides the cards directly to its participating employees.

Processing

4. Before the pay date, the employer transmits an electronic file to its bank telling it how much to credit to the employees' payroll card "accounts." The employer's bank serves as the ODFI and sends an ACH file containing these items to the ACH operator.
   Note: The employer's bank also may serve as the RDFI—or it may use its ODFI and a separate RDFI that offers the payroll card service. See Figure 5.

5. On the pay date, the RDFI posts the funds to the employees' accounts. The employees then have access to their funds.

6. The employee/payroll cardholder uses the card to purchase goods or services at a merchant location.

7. If the card is issued as a Visa or MasterCard account, it can be used anywhere that Visa or MasterCard are accepted and will be processed like either a credit card or an offline debit card transaction. If the card is PIN-based, the employee also can use it to make online, PIN-based, debit purchases.

Contactless payments

Contactless payments are evolving to serve as a substitute for small-ticket cash purchases and enable the use of card information without having to actually swipe a card. A variety of technologies can be employed to effect such transactions including Bluetooth, infrared, and, most recently, radio frequency identification (RFID). Bluetooth and infrared technologies are experiencing some success overseas. In the United States, RFID is gaining in appeal partly because of its packaging flexibility.

ExxonMobil is experiencing success with its RFID product, which is a key fob called Speedpass. In just over five years, more than 6 million consumers have signed up for Speedpass, which can be used at more than 8,100 Exxon locations nationwide and more than 400 Chicago-area McDonald's restaurants. MasterCard has developed a product called PayPass, which on a pilot basis has been integrated into credit cards issued by Citibank, J.P. Morgan Chase, and MBNA and into Nokia phones. American Express is piloting a key-fob product called ExpressPay. And, Timex and Exxon have partnered to produce a watch with RFID technology.

Payments effected using an RFID device are initiated when a consumer either waves his/her device over a transponder terminal or, in the case of the Nokia phone, taps the phone on specially equipped readers at checkout counters. From that interaction, the card information provided by the consumer at "enrollment" is accessed from a remote database and used for the payment. While the programs of the various providers of these products currently are not interoperable, there are some discussions under way that may facilitate such future interoperability.

Figure 29 outlines a simple transaction in which a consumer uses a contactless device provided by a card issuer. In this example, the device is linked directly to a card product offered by the card issuer. When the consumer makes a purchase, he/she waves the device over a transponder at the checkout counter. Via radio frequency, the consumer's card account information is accessed, and, if the account balance is sufficient, the merchant will be provided with purchase authorization. The transaction ultimately will be processed through existing payment card networks.

Figure 29: Contactless: Funding and Use

See Credit Card – Figure 6
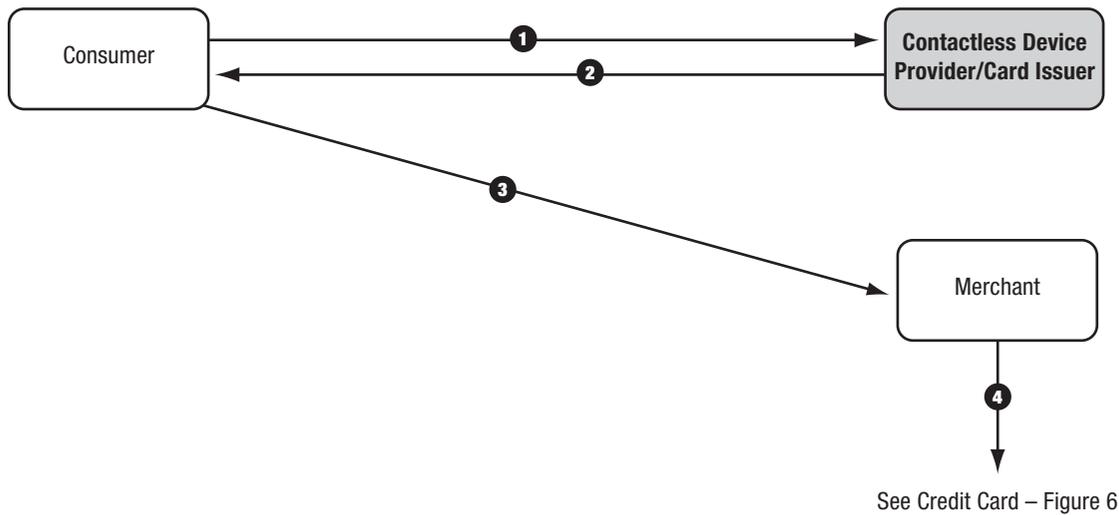
Authorization

1. A consumer enrolls with a card issuer to receive a contactless payment device and opts to link the device directly to a card offered by that issuer.

2. Upon successful completion of the enrollment process, the issuer provides the consumer with a payment device.

3. The consumer makes a purchase at a physical retail location. As payment for the transaction, the consumer waves the device over a transponder located at the checkout counter. The device communicates via radio frequency to access a remote database.

Processing

4. Providing that the transaction is authorized, processing will occur through existing card networks. See Figure 6 beginning with step 2.

5 Summary

Any survey of nonbanks in the payments system will cover a lot of ground. Nonbanks are involved in a myriad of payments activities at all stages of processing and are major participants in a majority of transaction types. They are, quite simply, an integral part of the payments system.

The importance of nonbanks in the payments system is likely to increase even more in the period ahead. As technology advances, outsourcing escalates, and paper increasingly gives way to electronics, nonbanks will become even more prevalent than today. What are the implications of this for the industry and for public policy?

This book represents a first step in addressing this question. It documents how extensive nonbank involvement is and identifies the roles played by nonbanks in specific transaction types. It suggests that settlement risk, at least at present, appears to be limited but that operational risk is a potential problem area.

Much additional research needs to be done. How serious is nonbank and bank exposure to operational risk? How should such risks be managed and regulated? In light of the complexity of third-party relationships, are settlement and systemic risks more serious than they appear? What are the synergies between banks and nonbanks and among nonbanks?

One thing is clear: The U.S. payments system has entered a period of rapid change and innovation, and nonbanks are at the forefront. It is imperative that policymakers monitor and study industry developments.

Endnotes

[1] Hence, "banks" also include other depository institutions, such as credit unions and savings and loan associations.

[2] Metavante is bank-owned.

[3] While broad, comprehensive statistics are difficult to come by, a study completed in 1998 estimated that the value of the U.S. payments business, as measured by total revenues, was more than $115 billion in 1996 (Bank Administration Institute and PSI Global 1998). Banks accounted for 25 percent of this revenue while nonbanks (payments-related software and hardware vendors and third-party service providers) accounted for 75 percent. The $115 billion figure was based on revenues generated from transactions fees, service charges, and other fees derived from processing cash, checks, cards, and electronic payments as well as various other revenue sources.

[4] For a discussion of the competitive challenges facing banks in the payments arena, see Bank Administration Institute and PSI Global 1998.

[5] Table 1 is not meant to be all-inclusive—nonbanks also participate in other activities that are payments-related, e.g., credit bureaus, armored car transportation, etc. The line is drawn, admittedly somewhat arbitrarily, at those activities "closest" to transactions. It also should be noted that there is some necessary overlap between activity categories.

[6] Both are bank-owned.

[7] The largest component, 58 percent, is cleared through the Federal Reserve.

[8] Shares are based on non-"on-us" transactions.

[9] For further discussion of EFT network ownership and consolidation issues, see Hayashi and others, 2003.

[10] A leading bank provider is Citicorp Services.

[11] The concept of systemic risk often is applied even more broadly, that is, reaching beyond payments systems. Examples include a bank failure leading to other bank failures or a country experiencing a currency crisis leading to other currency crises. For discussion, see Dow 2000, De Bandt and Hartmann 2000, Holthausen 1997, and De Nicolo and Kwast 2002.

[12] For further discussion, see Shen 1997 and Bank for International Settlements 2001.

[13] For further discussion, see Shen 1997.

[14] Meckler 1995 provides a good discussion of various bilateral payments risks.

[15] The National Settlement Service is a multilateral settlement service offered to depository institutions that settle for participants in clearinghouses, financial exchanges, and other clearing and settlement groups. For further information, see Federal Reserve Financial Services 2002.

[16] Hence, the settlement asset is a claim on the central bank. For further discussion of central banks' role in settlement, see Bank for International Settlements 2001 and Shen 1997.

[17] See Ginovsky 2002 and Garver 2002a, 2002b for discussion.

[18] See Seymann and Bonnette 2002, for example.

[19] A third provider, Visa, exited the ACH processing business; see *American Banker* 2002a, p. 1.

[20] The bank is exposed to some risk because under the NACHA rules, the ODFI would be warranting the validity of the transactions without having seen them. The ODFI would be liable if the corporate customer transmitted fraudulent or erroneous entries.

[21] The bill payment service would debit the consumer's account via ACH and then pay the billers using ACH credits or checks. Risk exists if for some reason the bill payment service originates the debits to consumers' accounts but does not originate the corresponding credits to the billers. In this case, the ODFI might be liable.

[22] The ODFI is subject to risk in this scenario in the event that the correspondent makes an error or fails to process its transactions. In addition, the correspondent may face risk. If the ODFI is unable to settle its position with the correspondent, the correspondent may have to cover those funds.

[23] The ODFI in this case is subject to risk because of potential errors on the part of the processor. The inherent risks associated with each of the four scenarios is typically addressed in agreements between the ODFI and third-party processor. See NACHA 1994, p. 77.

[24] These figures represent the total number of the general-purpose credit card, private-label credit card, and offline debit card transactions.

[25] Three other networks are American Express, Diners' Club, and Discover.

[26] Private arrangements most commonly are used for "on-us" transactions, in which the merchant's bank also is the consumer's (or issuing) bank. For more information, see Breitkopf 2002.

[27] For more information on types of online debit card transactions, see Hayashi and others, 2003.

[28] For more information on Internet payments, see Hayashi and others, 2003. For more information on DebitMan, see *ATM & Debit News* 2002.

[29] POS check conversion involves a number of risks. Consumer risk arises because of the possibility that both the check and ACH or EFT transaction could be processed. Also, if the consumer requests a stop payment, the payment may be processed anyway because back office processing for ACH, EFT, and checks typically is not integrated. However, with regard to ACH, the NACHA rules governing this process have been written to take situations like these into consideration and to provide the RDFI with the ability to return such items. There also is potential for merchant risk arising from a lack of information (name, address, and other useful information, such as a driver's license), which otherwise would have been obtainable from a physical check. If the merchant does not have the actual source document, it could be problematic if a dispute arises because all that is needed to originate the ACH item is the routing transit, account, and check serial numbers. Merchants could avoid these pitfalls by implementing more complex MICR-reading machines that also have imaging capabilities so they can capture information from the front of the check for possible use in return item disputes. Further, there is some degree of bank risk, which could arise from merchant fraud. In such instances, the ODFI warrants that the transactions are good and would be liable if they were not. For more information, see *EFT Report* 2001.

[30] For more information, see Bills 2002, *PR Newswire* 2002, and *Washington Post* 2002.

[31] Because the check is used only as a source document, these items truly are considered electronic funds transfers; consequently, the risks associated with the more traditional ACH process also are inherent with ARC items.

[32] It is estimated that U.S. consumers made 400 million bill payments online in 2001. For more information, see *Online Banking Report* 2002.

[33] It is estimated that 80 to 85 percent of P2P transactions are made with credit cards, 5 percent are made via ACH, and the balance of transactions are made with other payment options. See Global Concepts 2002.

[34] PayPal uses "viral" accounts, meaning that in order to retrieve funds sent by a PayPal user, the recipient also must open a PayPal account.

[35] Receipt of payments initiated via credit card is restricted to those with Premier or Business accounts because these account holders pay fees that help to cover the costs of accepting credit card payments.

[36] It is possible that the card is insufficient for the entire purchase amount and that some other form of payment is needed to supplement the purchase. However, for simplicity, it is assumed that the card has a sufficient balance.

[37] The EFT network also can be used to process EBT payments.

Glossary of Terms

Acquirer: Also referred to as the acquiring bank or merchant bank. A bank that has entered into an agreement with a merchant to accept deposits generated by bankcard transactions.

Association: Usually a group of banks that agrees to rules and processes that allow issuers and acquirers to provide payment services. "The Associations" is usually a reference to Visa and MasterCard.

Authentication: The process whereby an authorized card user's identity is verified. Signature-based products involve a visual signature inspection. PIN-based products involve an electronic comparison of secret information.

Authorization: The process whereby a card issuing entity determines that the cardholder's account has enough funds available to pay for the goods or services.

Automated clearinghouse (ACH) network: A funds transfer system governed by the rules of the National Automated Clearinghouse Association (NACHA). ACH provides for the interbank clearing of electronic entries for participating banks.

Automated clearinghouse (ACH) operator: A central clearing facility operated by a Federal Reserve Bank or a private sector organization in which participating banks transmit or receive ACH entries.

Batch: A group of records or documents considered as a single unit for the purpose of data processing.

Biller: A company or organization that sends a bill or statement, usually a request for payment for a product or service, to a consumer.

Bill service provider (BSP): An agent of the biller that provides an electronic bill presentment and payment service for the biller.

Capture: Converting the authorization amount into a billable transaction record within a batch. Transactions cannot be captured unless previously authorized.

Card processor: A third party that provides transaction processing and other services for a card issuer or acquirer.

Chargeback: The act of an issuing bank returning a previously authorized transaction to the merchant bank because of some defect. Common defects include: cardholder disputes amount, cardholder disputes performing the transaction, cardholder disputes the merchandise suitability.

Check truncation: Arrangements in which original paper checks are removed from the collection or return process before reaching either paying or depository banks or their customers. Currently, under typical check truncation arrangements, electronic information about the truncated checks, instead of the original paper checks, is presented to paying banks.

Closed loop: An issuing and acquiring scenario with the same institution on both sides of a card transaction.

Consolidator: A BSP that consolidates bills from other BSPs or billers and delivers them for presentment to the CSP.

Consumer service provider (CSP): An agent of the customer that provides an interface directly to customers, businesses, or others for bill presentment. The CSP enrolls customers, enables presentment, and provides customer care, among other functions.

Credit: An entry to the record of an account to represent the transfer or placement of funds into the account.

Credit risk: The risk that a party to a transaction will be unable to meet its financial obligations either when due or at any time in the future.

Debit entry: An entry to the record of an account to represent the transfer or removal of funds from the account.

Demand deposit account (DDA): An account holding deposits, which may be withdrawn at any time without prior written notice to the depository institution. A checking account is the most common form of demand deposit.

Draft: The instrument whereby the cardholder's data are captured. These data include card number, expiration date, amount of sale, signature of cardholder, merchant name, merchant address, and other information. This is the legal document for a transaction.

Drawee bank: The bank on which an item is drawn and must be presented to prior to receiving value for that item.

Electronic funds transfer (EFT) networks: ATM and online debit card networks.

Electronic benefits transfer (EBT): A benefit delivery system that provides public assistance recipients with electronic access to their cash and food stamp benefits.

Electronic bill presentment and payment (EBPP): The process that enables primarily consumer bills to be created, delivered, and paid over the Internet.

Electronic data capture: The method by which credit card or debit card information is electronified at the point of purchase thus eliminating the need for paper drafts to be stored and transported.

Electronic invoice payment and presentment (EIPP): The process that enables corporate invoices, primarily, to be created, delivered, and paid electronically.

Encryption: A data security technique used to protect information from unauthorized inspection or alteration. Information is encoded so that data appear as a meaningless string of letters and symbols during delivery or transmission. Upon receipt, the information is decoded using an encryption key.

Inquiry: The technical term used to describe an issuing bank's request to the merchant-sponsoring bank for additional information about a previously performed cardholder transaction.

Interchange: The fee paid by the merchant bank to the card-issuing bank for the privilege of allowing merchants to obtain funding from the cardholder's account.

Issuer: The association or network participant that issues cards.

Legal risk: The risk that a poor legal framework or legal uncertainties will cause financial exposure or losses to payments participants.

Liquidity risk: The risk that a party will have insufficient funds to meet its obligations when due, although it may be able to do so at some time in the future.

Lockbox: A financial service that facilitates rapid collection and posting of corporate receivables. Typically, it entails collecting items; sorting, totaling, and recording payments; and processing items and making bank deposits.

Merchant: A retailer or any other person, firm, or corporation that, according to a merchant agreement, agrees to accept credit cards, debit cards, or both when properly presented in exchange for the sale of goods and services.

Merchant bank: *See Acquirer.*

MICR encoding: The abbreviation for magnetic ink character recognition. MICR characters are the numbers and symbols that are printed in magnetic ink on checks and other documents for automated processing.

National Automated Clearinghouse Association (NACHA): The national association that establishes the rules and procedures governing exchange of ACH payments among banks.

Operational risk: The risk that hardware or software problems, human error, or fraud will cause an operational malfunction that will lead to financial exposure and possible loss.

Originator: A person or entity that has authorized an ODFI to transmit a credit or debit entry to a receiver's RDFI.

Originating depository financial institution (ODFI): A participating bank that originates entries at the request of and by agreement with its customers in accordance with the provisions of ACH rules.

Personal identification number (PIN): A sequence of digits used to verify the identity of a device holder.

Point of sale (POS): The place where a card transaction is executed. Can be a standalone swipe machine, an integrated cash register, an ATM, a PC application, or a Web site, as well as a personal telephone call that authorizes and submits transactions for posting and settlement.

Processor: A generic term used to define a broad set of third-party service providers.

Receiver: An individual, corporation, or other entity that has authorized a company or an originator to initiate an ACH credit or debit entry to a transaction account held at an RDFI.

Receiving depository financial institution (RDFI): Any bank qualified to receive debits or credits through its ACH operator in accordance with ACH rules.

Routing number: A nine-digit number (eight digits and a check number) that identifies a specific bank. Also referred to as the ABA number.

Settlement: The final, irrevocable transfer of funds between parties in a payments system.

Settlement date: The date on which an exchange of funds with respect to an entry is reflected on the books of the Federal Reserve Bank(s).

Settlement risk: The risk that final settlement fails to take place, leading to a financial loss.

Single entry: A one-time transfer of funds initiated by an originator in accordance with the receiver's authorization for a single ACH credit or debit to the receiver's consumer account.

Systemic risk: The risk that the failure of one party in a payments system will lead to the failure of other parties in the system, having a domino effect that may eventually be transmitted to other parts of the financial system or economy.

System-wide risk: Refers to situations in which, in the event of a shock, the amounts transferred through a payments system are too small to have repercussions throughout other parts of the financial system but still could be very disruptive to that particular system.

Unwinding risk: The unwinding of financial obligations that can occur if there is a settlement failure in a net settlement system and payments instructions that accumulated during the day are allowed to be revoked.

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3. Bank of England, *Oversight of Payment Systems,* November 2000
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