

## CHAPTER 2

### PAYMENT SYSTEMS

#### Objectives

After reading this chapter you will be able to:

- Understand the basic terminology used in making payments
- Evaluate the principal U.S. payment methods
- Determine the benefits, costs and risks associated with each payment method
- Appreciate payment system risk

#### Introduction

At the request of the treasurer, Bill Fold, Ann I. Shade, the cash manager, is undertaking a complete review of GETDOE's cash management systems. One of the areas that has been highlighted for particular attention is how the company manages its cash transfers. While many companies in the industry have already moved to electronic payments, GETDOE is still decentralized and, as a result, disbursements are through many different banks, primarily by check. There has been no opportunity to take advantage of the economies of scale and efficiencies that centralization can provide.

Ann's research revealed that some of the traditional float advantages of paying by check have been eroded by the collection techniques offered by banks. In addition, the actual cost of issuing and processing checks has been greatly underestimated, especially when all associated costs are considered, including disbursement equipment, check clearing and reconciliation, and postage. The company is experiencing competitive and supplier pressure to move to electronic payments. Ann and Bill will have to evaluate the implications, tradeoffs and expenses, prior to making a decision.

The U.S. payment system is undergoing a fundamental change. Although still a very heavily paper-dominated system, with checks accounting for nearly 50 billion of the estimated 80 billion payments made annually, a recent study by the Federal Reserve indicates that electronic methods are gaining ground. In the period between 1979 and 2001 even though check volume grew by 55%, electronic payments rose from comprising 15% of total volume to approximately 40%. Almost 75% of electronic payments

are made through the ACH. Exhibit 2.1 compares the volumes and value of transactions for 2001 for the major U.S. payment systems

EXHIBIT 2.1  
Comparison Of U.S. Payment Systems  
(2001 Annual Volume)

PAYMENT TYPE	VOLUME	VALUE
Fedwire	112.455 million	\$423 trillion
CHIPS	60.378 million	\$311.7 trillion
ACH	7.994 billion	\$22.1 trillion
Checks	49.1 billion	\$47.4 trillion

Important Concepts

In order to understand payment systems, there are a number of concepts that need to be defined.

Clearing and Settlement Systems

Clearing and settlement are two different processes that do not always occur simultaneously or in the same place.

- *Clearing* is the process of recording transactions between members of a clearing channel, such as the Clearing House Interbank Payments System (CHIPS). CHIPS acts as a clearing house for its members but settlement occurs across the members' accounts with the Federal Reserve Bank
- *Settlement* refers to the act of transferring funds from a payer's account to a beneficiary's account. By definition, settlement can occur only through a bank or banks. Most often, the central bank in a country acts as the primary settlement agent. Payment systems either settle immediately on a bilateral basis or after some delay on a multilateral net basis. To reduce the risk inherent in delayed settlement net settlement systems have been shortening the clearing cycle in order to transfer funds closer to the time of origination of the transaction.

Immediate Settlement Systems

The Fedwire, operated by the Federal Reserve System (the Fed), is an example of a real-time gross settlement (RTGS) system. Transactions settle singly or bilaterally with a simultaneous debit to the sender's bank and credit to the receiver's bank. RTGS systems provide same-day

finality. They are used for most high value electronic payment systems because RTGS eliminates many of the intra-day and participant settlement risks associated with net settlement.

### Delayed Settlement Systems

With a net settlement system (NSS), multiple payments and receipts between participants are settled at the end of a period on a net basis, resulting in a single debit or credit to each member's settlement account. An example is the Automated Clearing House (ACH) that settles one or two business days forward. Due to the delay between initiation and settlement, an intra-period risk is created. For that reason, NSS systems are usually used for low value payments.

### Hybrid Systems

Increasingly, NSS systems are being redesigned to reduce the time between origination and settlement to reduce risk. There are now a number of systems that settle on a net basis at frequent intervals during the day. Continuous Link Settlement (CLS), discussed in Chapter 7, is an example of a real-time net settlement (RTNS) system.

### Transaction Types

- Credit transactions: the person making the payment (the buyer) initiates a payment transaction to credit the account of a beneficiary (the seller).
- Debit transactions: the beneficiary initiates a transaction to debit a seller's account. These transactions are usually pre-authorized.

### Electronic Payment Methods

U.S. electronic payment systems include Fedwire, CHIPS, and the ACH.

#### The Fedwire System

*Fedwire* is an RTGS payment system that processes on a same-day basis without settlement risk to the participants, as the Federal Reserve guarantees payment. It uses a communications system linking the 12 district and 25 branch banks of the Federal Reserve Bank, and is the primary payment system for high-value, domestic U.S. dollars and the settlement of U.S. government securities.

Host-to-host computers, online terminals and other technology link over 11,000 member institutions. In 2001, the Fed reported that the Fedwire

processed an average daily volume of 446,252 transfers totaling \$1.68 trillion or an average value per transfer of \$3.8 million. Participant banks settle through their accounts with the Federal Reserve Bank (see Exhibit 2.2)

[Insert Exhibit 2.2 here]

### Fedwire Advantages and Disadvantages

The advantages of using a Fedwire are:

- Value: immediate, same-day value
- Settlement: no settlement risk
- Finality: funds cannot be recalled without the beneficiary's permission once the payment has been sent by the sending bank and is confirmed by the Federal Reserve Bank
- Guaranteed payment: the Fed guarantees payment should the sending bank fail
- Speed: very fast, although slight delays may occur when a sending bank has reached its daylight overdraft limit at the Federal Reserve, (see section on payment system risk in this chapter) or at peak operating times such as when the New York
- Security: reliable and secure

The major disadvantages are:

- Cost: expensive to use relative to other payment types
- Credits only: Does not process debit transfers
- Limited automation linkages: as not all financial institutions are on-line with the Fed, some have to make alternative arrangements, either through member banks or over the telephone. This can slow the process and introduce errors.

### Fedwire Security

Because of the large dollar values being transferred through the Fedwire system, security is an important issue. In order to comply with the Uniform Commercial Code Article 4A (UCC 4A), discussed in Chapter 8, banks must offer their customers "commercially reasonable" security procedures. These procedures include:

- Securing the terminal and software at the company site
- Using passwords, test keys, and personal identification numbers (PINs) to access the system
- Multiple levels of entry and release
- Encryption to ensure the privacy of the message

- Authentication, digital signatures and digital certificates to assure identity of the sender
- Smart key devices to secure against unauthorized access

Fedwire activity continues to grow, in part because the 1980 Monetary Control Act gave increased access to the Fedwire, and also because of the general growth in business activity. While volume increases are in the single digits, the dollar value of transfers has been increasing at a far greater rate. Federal Reserve Bank Fedwire Statistics show that, in 2001, volume grew by 3.8% while dollar value growth was 11.6%.

In addition to its role in funds transfer, the Fedwire is also used for the settlement of U.S. government securities. Treasury Bills (T-Bills) have been issued in book entry form since 1977. The purchase and sale of these securities occurs by charging and crediting the respective parties' bank accounts by Fedwire.

### Clearing House Interbank Payments System (CHIPS)

*CHIPS* is a bank-owned, computerized, telecommunications network operated by the New York Automated Clearing House. It currently links 56 U.S. and foreign banks that have offices in New York City. In 2001 CHIPS processed 95% of all international U.S. dollar payments moving among countries. CHIPS handles an average daily volume of 243,500 transactions with a total value of \$1.22 trillion or an average value of \$5 million. The majority of the volume comprises interbank movements, Eurodollar payments, and the settling of foreign exchange transactions.

Originally designed as an NSS with settlement at the end of the day, in 2001 CHIPS converted to a real-time net settlement system (RTNS), thereby eliminating most of the daylight overdraft exposure and time delays in effecting payments. The new system also provides enhanced information reporting capabilities to support the growing e-commerce needs of corporate customers. It can now transmit up to 9,000 characters of data in either standard electronic data interchange (EDI) formats or the new Internet formats, such as extensible mark-up language (XML).

CHIPS is also used for payments under letters of credit and documentary collections.

### CHIPS Advantages and Disadvantages

The advantages of using CHIPS to make payments are:

- Value: immediate, same-day value

- Settlement: settlement risk is virtually eliminated through special pre-funded accounts held at the Federal Reserve
- Finality: funds cannot be recalled after their release into the CHIPS system
- Speed: very fast and may be more efficient in using a bank's liquidity than the Fedwire due to the net settlement process
- Security: reliable and secure
- Information: up to 9,000 characters of data can accompany the payment

The major disadvantages are:

- Cost: expensive to use relative to other payment types
- Credits only: does not process debit transactions
- Limited direct membership: much more limited direct membership than with the Fedwire, although many financial institutions gain access to CHIPS through correspondent relationships with member banks.

### Automated Clearing House (ACH)

The *ACH* network offers an electronic alternative to the check. It provides a funds transfer system for U.S. dollar domestic transactions through a network of regional ACHs. The ACH system was established to effect inexpensive settlement of low value, high volume, and mainly repetitive payments on a batch basis. According to the National Automated Clearing House Association (NACHA), the annual volume of transactions in 2001 rose to 7.994 billion, representing a total value of \$22.1 trillion.

*NACHA* was established in 1974 to form an interregional link between the ACHs. *NACHA* provides a nationwide electronic payment and collection network among U.S. financial institutions. The major attributes of the ACH are:

- An electronic batch process, store-and-forward system
- Processes both debit and credit transactions
- Transmits additional payment-related information
- Typically used for low value, non-urgent transactions (although the ACH can handle payments of up to \$99,999,999.99)
- The type of transaction determines both availability and finality of funds :
  - Credit transactions settle two business days after origination and are final once credited to the beneficiary account.
  - Debit transactions settle one business day after origination and can be refused.

- Originator and receiver settle on the same day, so there is no float associated with ACH payments

Exhibit 2.3 illustrates the payment flow when a company uses the ACH to pay its employees.

[Insert Exhibit 2.3 here]

The majority of ACH payments are used for corporate-to-consumer payments. Credit transactions are used for payroll, pension and annuity payments. Debits transactions, also known as direct debits, are used for consumer bill payments, such as utility bills, phone bills and insurance premiums. Corporate use has been largely for cash concentration, direct deposit of payroll, and trade payments.

### ACH Advantages and Disadvantages

The advantages of using the ACH to make a payment are:

- Value: Payments can be made on precise settlement dates.
- Cost: The ACH provides a low cost, electronic alternative to checks and wires. Current pricing for ACH transactions is in the 10 to 20 cent range, whereas Fedwires can cost over \$10 each for the sender and the recipient.
- Reliability and efficiency: Compared with checks, ACH collections are far more predictable.
- Electronic processing and interfaces: The system allows for automated interfaces to reconciliation and cash application systems.
- Payment options: The ACH handles debit as well as credit transactions, providing opportunities for improved collection processes.
- Accelerated inflows: By reducing float in the entire collection process, cash inflows are faster than check receipts.
- Batch processing: The ACH handles repetitive batch transactions, such as payroll, pension and annuity payments (credits), and collection of insurance premiums, utility bills and mortgage payments (debits).
- Information: Large amounts of information can be transferred with the payment.
- Security: The system is reliable and secure.
- Fraud prevention: While not fraud-proof, electronic systems are more secure than paper payments.

The major disadvantages are:

- Delayed settlement: ACH payments settle one or two days later than Fedwire and CHIPS payments.
- Finality: The ACH does not offer the same guarantee of finality as Fedwire or CHIPS payments as debits can be returned unpaid.
- Loss of disbursement float: ACH transactions clear days faster than checks.
- Initial start-up costs: In addition to development and systems costs, there are costs associated with ongoing support and maintenance of dual systems.
- Change of procedures: Moving to the ACH requires a change of internal procedures and compliance of customers, vendors and suppliers.
- Concerns with debits transactions: Companies (and consumers) may be unwilling to authorize direct debits to their account due to apprehension concerning security and loss of control. Many banks offer systems that protect against unauthorized debit transactions over pre-approved limits.
- Uneven capabilities: Not all financial institutions that claim they are ACH-capable are able to process addenda records.
- Security: Controls are not as extensive with the ACH as for Fedwire, making it riskier to use for large value payments.

Because of the price differential between the Fedwire and the ACH, companies have increasingly been using the ACH for non-urgent, large value payments. This is raising concern with the system participants and the regulators about the increased credit risks for the originating depository financial institutions (ODFIs). The risk arises because the ODFI cannot recall or reverse a file once it has been released into the ACH system. With settlement not completed until one or two business days later, the originator may not have sufficient funds in the bank or may have declared bankruptcy. Many banks now require pre-funding or a credit facility to be in place to support high-value ACH activity.

### Tips and Techniques

The majority of payments made by cash managers are known in advance of the due date. Where a specific value date and certainty of settlement are required, such as for contractual payments or debt repayments, the ACH can provide an attractive low-cost alternative to the Fedwire.

### Checks

Although the majority of payments in terms of dollar value are completed by electronic means, by far the largest percentage of consumer and corporate payments in terms of volume are made by check. The



Depository Financial Institution Check Study found that in 2001, 49.1 billion checks are written in the U.S. with a value of \$47.4 trillion. A *check* is a written order by an account holder to the bank to pay a specified sum of money to the bearer or named recipient. The parties are defined as follows:

- The *payor* is the person or company issuing the check.
- The *payee* is the person or company to whom the check is payable.
- The *drawee bank* is the payor's bank where the check is drawn.
- The *deposit bank* is the financial institution where the payee first deposits the check for crediting to the account.

### Characteristics of Checks

Checks are drawn on the payor's demand deposit (checking) account (DDA) at the drawee bank. Negotiability of the document is key to the success of paying with paper instruments. When a check is written, it is made out "Pay to the Order of" the payee, not "Pay to" the payee. This is important in order to enable the check to move through the banking system. The payor allows the drawee bank to pay anyone who presents the item, as long as the payee has signed or endorsed the check. Checks are demand instruments and cannot be post-dated at the time of presentation to the depository bank.

Initially, the check had to move physically from the bank of deposit to the drawee bank. However, checks are increasingly being digitized through check truncation and electronic check presentment (ECP). The information is transmitted to the drawee bank and is used for settlement. The check may follow later, be retained by the Federal Reserve or the bank of deposit, or returned to the payor for destruction.

### The Check Clearing Process

There are a number of ways in which checks can clear, with most banks using a combination of all methods. Selection of the appropriate method will depend on the deposit bank's availability schedules with various clearing agents, location of the drawee banks, the bank's processing capabilities, and costs (including clearing fees, postage and couriers). Community and rural banks clear their deposits either through a large correspondent bank or through the Federal Reserve.

The steps in clearing a check are illustrated in Exhibit 2.4. Banks send checks for clearing by means of a cash letter. The *cash letter* is a batch of checks with a tape listing on the cover document that summarizes the

content of the bundle and the total dollar value. This cover document acts as a deposit slip for the depositing bank.

[Insert Exhibit 2.4 here]

The primary clearing channels are:

- The Federal Reserve System. One of the major clearing channels is the Federal Reserve, which operates a nationwide collection facility through its branches and Regional Check Processing Centers (RCPCs). A bank deposits the checks with its local Federal Reserve Bank, which forwards the items to the drawee banks. Once presented, settlement occurs through the banks' settlement accounts with the Fed.
- Clearing Houses. Many regions operate a local clearing house (i.e., the New York Clearing House Association) to facilitate the exchange of items drawn on member banks. Settlement occurs on a net basis across the accounts maintained with the local Fed.
- *Correspondent Banks*. To facilitate business between regions, many banks maintain accounts with other banks (called correspondent banks). The depository bank sends the cash letter to a bank in the area on which the checks are drawn. The use of a correspondent bank network can accelerate availability and reduce the cost of clearing through the Fed.
- *Direct Sends*. To achieve faster clearing times, the bank may send the cash letter directly to the drawee bank or distant Fed, if it maintains an account with either. Settlement occurs by crediting the bank of deposit's account with the distant Fed or the correspondent account with the paying bank.
- *On-Us Clearing*. When the bank of deposit and the paying bank are the same, the bank will make a same day debit to the payor's account and credit to the payee's account, providing immediate (same-day) availability.

#### Check Advantages and Disadvantages

The major advantages of using checks are:

- Readily available: A checkbook is provided with every demand deposit account. There are no systems to install, training to be given, or education of vendors and suppliers.
- Widely used: Checks are widely accepted as a method of payment in the U.S.

- Disbursement float: The disburser gains float from the delay in mailing payments, processing the items, and check clearing.
- Efficient: The check system is well established and works efficiently.
- Limitless information: When information needs to accompany the payment, it is easy to do so using a remittance document.
- Anyone, anywhere: When the details of a payee's bank account are not known, a check can be sent to the address on file.

The major disadvantages are:

- Fraud: Paper instruments are much more susceptible to fraud than electronic transfers.
- Use for international payments: Checks are not always an acceptable method of payment outside the U.S., can involve a costly collection process, may incur mail delays, and may require a currency conversion
- Cost: Due to the ancillary costs of storing, processing, reconciling and special bank services such as controlled disbursement and positive pay (described in Chapter 4), the all-in cost of checks can be more expensive than using the ACH.
- Collection float: A check delays availability of funds by two or three business days.
- Finality: A check can be returned unpaid for a number of reasons including insufficient funds, a closed account, or a stop payment order.

### Tips and Techniques

Treasurers who are still using checks extensively should consider converting to electronic payments through the ACH. Disbursement float is diminishing and the benefits of automated processing in terms of forecasting cash flows, automated reconciliation, cash application and reduced per item costs are considerable. Some start-up costs will be incurred, as will renegotiation of contract terms, and education of employees, customers, and suppliers. Most companies find that they can achieve payback within two years.

### Other Payment Mechanisms

Although checks are by far the most widely used non-electronic form of payment, there are a number of other types of instrument used in the U.S.

### Trade Drafts

*Trade drafts* are primarily used in international transactions, as supported by documentation attesting that the terms of the trade have been met. A draft is a written order to pay, drawn against the payor's bank, and sent through the normal clearing process to the payor's bank by the payee. If a check is an "IOU" then a draft is a "You Owe Me". It is the paper equivalent of a debit transaction through the ACH. The payor retains the right to honor or reject the draft when it is presented to the drawee bank. Drafts can be payable on demand, as with a "sight draft", or at a specified date in the future, called a "time draft".

### Bank Drafts (Cashier's Checks)

A *bank draft* is a check drawn by a bank on its own account. Bank drafts are used in certain transactions where a paper instrument is being presented to close a transaction but the beneficiary requires a bank guarantee of payment. In years past, residential real estate transactions closed with bank drafts; current practice is a wire transfer. Drafts are also used when companies need to make a foreign currency payment but do not maintain an account in that currency. The bank will issue a currency draft drawn on its correspondent bank account.

### Cash

A number of businesses remain cash intensive, such as the fast food sector of the restaurant industry. While cash provides the illusion of instantaneous availability, unless it is going to be used for disbursing it has little value until it has been deposited into a bank account. Many small retailers with cash sales use these receipts to pay their vendors and employees. This is an efficient use of the cash as it eliminates the cost and time involved in making cash deposits.

The advantages to using cash are:

- Fungible: Small amounts of cash are nearly always accepted.
- Speed and finality: Funds are assured as soon as cash changes hands.

The disadvantages to using cash are:

- Physical nature: Cash needs to be physically handled and, if lost, cannot be replaced.
- Low dollar value: It is usually not acceptable for large dollar transactions.
- Fraud: Modern technology enables currency notes to be very convincingly reproduced. Machines for detecting fraudulent bills are available but counterfeiting continues to be a major problem.
- Non-earning asset: Cash is a non-earning asset until deposited or used.
- Security: Extra security and costs may be involved in transporting cash to the point of deposit.

The non-traceable nature of cash also makes it especially suspect when traded in large quantities. In the U.S., banks must complete a Currency Transaction Report (CTR) for all deposits of \$10,000 or more, even for interbank transactions.

### Credit and Charge Cards

Credit and charge cards allow the vendor to receive value on a transaction while the purchaser enjoys a grace period of up to 30 days before the bill is presented.

- With *charge cards*, such as American Express, the full amount is due when the bill is presented. There is often no pre-set spending limit and the issuing company charges an annual fee to the cardholder.
- With *credit cards*, such as Mastercard and Visa, a minimum payment is due upon presentment of the bill but the remaining balance can be paid over a period of time, thereby extending credit. Credit cards have a stated purchasing limit, and interest rates on the unpaid balance are at the top end of the legal limits. Credit cards are usually one of the most expensive sources of credit.
- Companies issue *corporate charge cards* to employees who are authorized to make purchases on the company's behalf. The bill is presented to the employee, who is responsible for paying the amount in full. The employee then reclaims the expenses through the company's reimbursement process.

### Procurement Cards

Companies use *procurement cards*, also known as purchasing cards, to reduce the costs and related administration of purchasing within the

company. Unlike the corporate charge card, the card issuer sends the consolidated, detailed invoice of all of the purchases for the billing period directly to the company for payment. The company pays with a single payment. The details are available electronically to enable the company to update its records and automatically reconcile the accounting for purchases. Procurement cards are discussed in more detail in Chapter 4.

### Payment System Standardization

Payment system efficiencies depend upon the standardization of messages that are used to transmit information between trading partners and banks.

#### Electronic Data Interchange (EDI)

*Electronic data interchange* refers to the electronic exchange of information between trading partners using formatted messages. EDI allows companies to initiate messages directly from their applications to be communicated electronically to the receiving party. EDI standards were developed in the early 1980s by dominant companies (such as General Motors) for use with their own trading partners. Industries such as chemicals, oil, transportation and medical services have all developed conventions and message formats for use when trading between buyers and sellers.

*Financial Electronic Data Interchange (FEDI)* refers to EDI messages concerning financial transactions, such as lockbox reports, the account analysis, remittance advices and payment initiation. Many FEDI message types use NACHA or Accredited Standards Committee (ASC) X12 formats. EDIFACT, the EDI standard in development by the United Nations, is widely used in Europe.

Although EDI had been used initially to simply digitize the communication process, more recent developments have enabled companies to reengineer the business cycle to make it more efficient. Examples of applications that streamline the value chain by eliminating both the order and invoicing processes include:

- *Paid-on-Production (POP)*, where payment for goods becomes due upon use in the manufacturing process.
- *Evaluated Receipts Settlement (ERS)*, when a payment is automatically generated based on the receipts at the loading dock.

#### In the Real World

The U.S. has led the way in the development and use of EDI, largely due to the leverage of some of the world's biggest multinational companies. As a result EDI has been adopted as standard operating practice by a number of industries. Outside of the U.S., adoption has been slower, due to the perceived high cost of entry in terms of systems, technology interfaces and trading partner resistance. Many smaller companies that are not already involved in using EDI see the development of Web-based applications as a low cost way of achieving the same levels of automation and end-to-end processing efficiencies.

### NACHA Formats

NACHA has developed a number of formats to handle ACH transactions. These standardized messages are used by all banks and parties involved in originating, processing and receiving ACH payments. Appendix 2 lists some of the formats most commonly used by cash managers, such as the CCD format for cash concentration.

### SWIFT

*SWIFT* (Society for Worldwide Interbank Financial Telecommunications) is a bank-owned, global telecommunications system. Developed in the early 1970s, it created a series of strictly standardized messages for the exchange of financial information between financial institutions. Electronic links have been built between SWIFT and the local electronic clearing systems in many countries, allowing messages to pass through in an entirely automated fashion. For example, CHIPS members in New York who need to send an international wire transfer have a direct link between their back-office system, the CHIPS system and SWIFT. This allows a formatted message to pass through electronically from originator to recipient, through the clearing house and settlement bank, for straight-through processing (STP).

Most recently, SWIFT has moved into creating formatted messages for other financial players and new mediums, such as transferring the entire letter of credit process onto the Internet and providing Web-based functionality for business-to-business (B2B) transactions with SWIFTNet. Appendix 3 provides a chart of the SWIFT message types that are of most interest to cash managers, such as the MT100 message series used for money transfers and the MT900 series used for balance reporting.

### Payment System Risk

For the last two decades the Federal Reserve has been concerned with the possibility of the failure of one or more large financial institutions.

Measures have been introduced by the Fed to reduce payment system risk by assuring the finality of payment.

*Daylight overdrafts*, i.e., when an account is overdrawn at the Fed during the course of the day, are a particular concern, as this situation creates an intraday credit exposure. To control the level of daylight overdrafts, the Fed requires that all banks put in place a “*sender net debit cap*”, limiting the intraday overdraft that a bank may incur across all the large dollar payment systems. The Fed also has the right to charge banks for any daylight overdraft at their Fed account.

Most recently, the ACH moved to bring the times of settlement and finality for ACH credits closer together. Under the previous policy, the Fed had the right to reverse a transaction up to 24 hours after settlement. The new policy “ACH Settlement Day Finality”, effective in June 2001, means that credit originations become final at the same time as they post, at 8.30 a.m. ET on settlement day. However, in order to achieve this, the Fed is requiring that any forward ACH credit transactions be pre-funded at the Fed settlement account.

### Summary

This chapter reviewed and compared the major payment vehicles used in the United States, along with their advantages and disadvantages. It discussed the different types of clearing channels and the mechanisms that can render the systems more efficient. The following chapters will look in more detail as to how these payment systems are used for collections, concentration and disbursement and the implications of each for the cash manager.

After consideration of the advantages and disadvantages of electronic payments, Ann has determined that GETDOE should begin to migrate its disbursements to the ACH. She fears that if the necessary changes are not initiated, GETDOE will eventually lose competitive advantage by not being as efficient as its peers in the industry. Ann realizes that the process will not be accomplished overnight and that much negotiation lies ahead with GETDOE’s employees, vendors and suppliers.