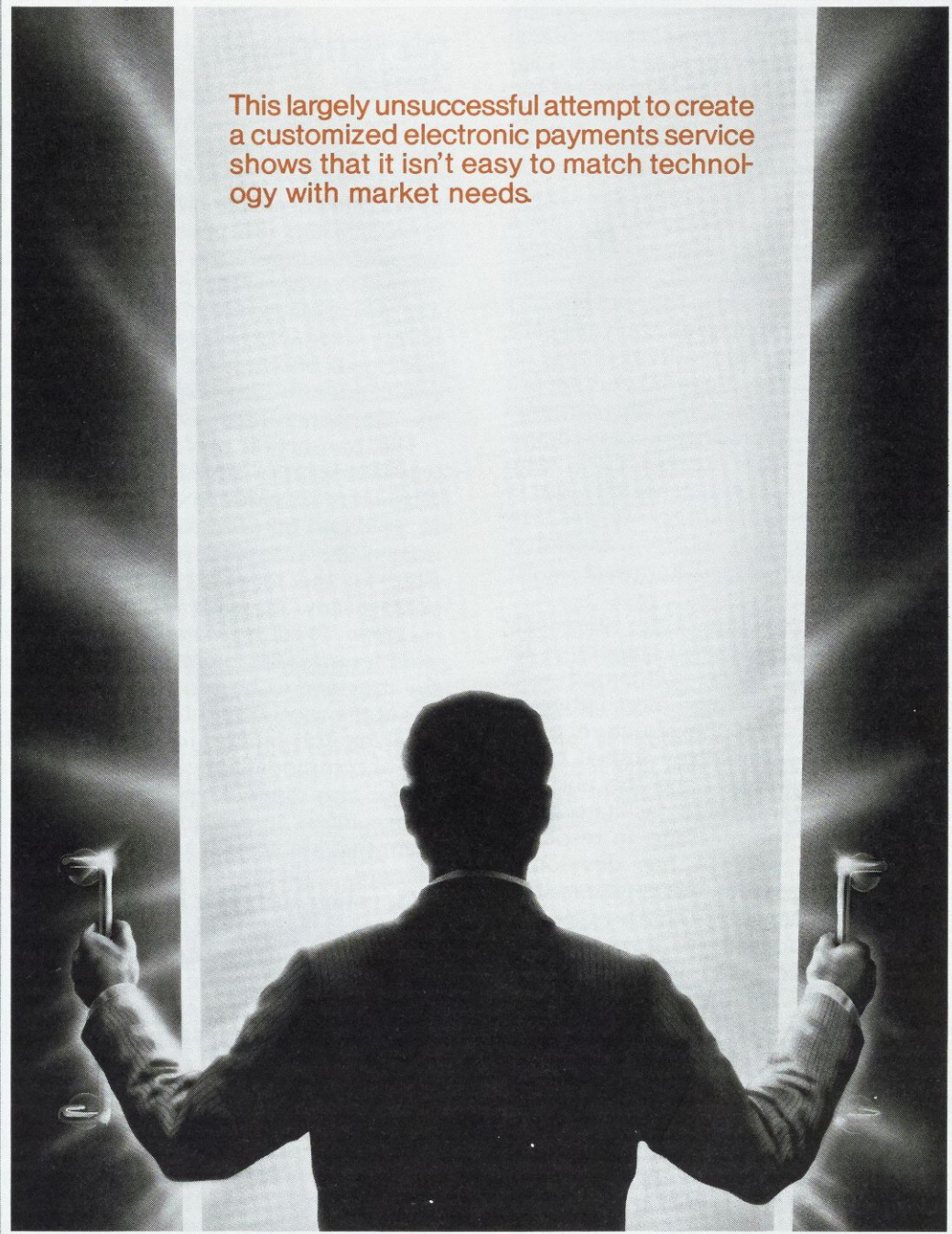


Corporate Trade Payments: Hard Lessons in Product Design

Bernell K. Stone

This largely unsuccessful attempt to create a customized electronic payments service shows that it isn't easy to match technology with market needs.



Corporate trade payments—payments that businesses make to their vendors and suppliers—seem a logical area for automated clearinghouse use. Most businesses already maintain computer-based systems for creating checks; the same data could as easily generate ACH transactions. The ACH is not, however, widely used for corporate trade payments.

By 1983, ACH volume was limited to just a few classes of payment transactions: Social Security and other government pension payments, direct deposit of payroll, and preauthorized insurance debits. Use of the clearinghouse for cash concentration grew rapidly because of the late cycle processing option introduced in 1979. There was, however, virtually no use for business to business payments except for a minute volume in dealer-distributor payments.

The limited use of the ACH in this payment segment is sometimes traced to the absence of a way to provide the information that normally accompanies trade payments. In response to this apparent need, the National Automated Clearing House Association (NACHA) designed a new ACH service, appropriately named corporate trade payments (hereafter CTP), with the capacity to attach an extensive message to a standard ACH payment transaction. This new service, tested successfully in 1983 and introduced in January 1984, failed to attract significant volume.

The reason for the failure of this seemingly attractive service has been the subject of intense debate among those concerned with electronic payments. Two common criticisms of the CTP service arise: the structure of its message capability—a semi-fixed format rather than variable-length format—and the absence of a data content standard to facilitate automated processing of the message. In response to these criticisms, NACHA has developed another service designed for trade payments—corporate trade exchange (CTX). The CTX service provides the capability to have variable-length records and use a data content standard.

An assessment of why the CTP service has failed to attract corporate payments can help determine the requirements for a successful electronic trade payment and advice service. It can also indicate what is needed for the new CTX service, thus foreshadowing its prospects

for market acceptance. A retrospective look at the CTP also can illustrate, with the benefit of hindsight, the complexity and difficulty of introducing an electronic payment service. Finally, the analytical framework set forth here can serve as a model for market analysis based on the needs of payors, payees, and their financial institutions.

The ACH Corporate Trade Payment Service

From its inception in 1974 until 1983, the ACH system provided for only single payment transactions, which used a 94-character format to encode check-like payment data in electronic form. It listed the payor institution and payor account number, the payee institution and account number, the payment amount, dates, and processing codes. This standard ACH payment record was limited in its ability to include additional information with the payment that would identify and explain the transaction to the transaction receiver.

The transaction record's message capability was restricted in several ways. First, of the 94 characters available in the transaction, only 30 to 34 could be used for messages. Second, no universally accepted rules or procedures existed for the receiving institution to follow in passing any message on to the transaction receiver. Third, no data content standards existed for message information that would enable the message to be processed automatically by either the receiving institution or the transaction receiver. This limited message capability could not accommodate the payment advice essential for most trade payments. The term *payment advice* refers to any information about a payment that identifies it and explains the payment amount. "Identifying the payment" requires information such as a reference to the invoice or invoices being paid and other data necessary for the payee to update its accounts receivable by giving credit to the paying company. Often the payment advice will explain adjustments that make the amount paid different from the amount invoiced.

The CTP Transaction

To address the market for corporate trade payments, NACHA introduced CTP, which expanded the standard 94-character payment

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record by including the ability to attach from 1 to 4,999 additional message records of 94 characters each to the payment transaction.

The pricing structure of the CTP service involves a minimum charge for 15 addenda records, even if fewer than 15 records are used, plus an additional charge for each record in excess of 15. The CTP service allows one free-form, or variable-length, message.

A paying company could provide an electronic payment advice by "packing" the advice information into this series of 1 to 4,999 addendum records of 94 characters each. This advice would be sent through the ACH system and delivered to the receiving institutions along with the payment transaction. The receiving institution would presumably pass this electronic payment advice on to the payee along with the payment itself, giving the payee the same information provided by a check payment and advice. Thus, the payee could update accounts receivable and, if necessary, inform the payor of any problems such as disagreements on discount or other payee adjustments to the invoiced amount.

In essence, the CTP transaction seemed to provide an electronic analogue to a check payment and printed advice by providing for both payment and advice information.

The Pilot Test

Announcing its CTP service capability in the spring of 1983, NACHA proposed a pilot test for June through December. The pilot, involving a number of large companies and banks, tested the ACH's ability to handle a payment with addendum records. The Federal Reserve accommodated NACHA by producing the software for sending addendum information.

In the test, the ACH simply transmitted the addendum information and engaged in no processing other than the sorting and merging necessary to process the payment. The message information was packed into the 94-character records by either the initiating company or the originating depository institution; the receiving depository institution unpacked the message and delivered it to the payee. Essentially, the CTP service was an electronic data transmission capability that matched addendum data with a specific payment record and sent the message along with the payment data. In CTP processing the addendum data is handled in the same way

as an electronic mail service. There is no processing of the message as such, but merely a store-and-forward transmission from the originating company to the receiving company.

In the pilot, both the procedures for handling addendum information and the software functioned as designed—the pilot was a technical success. Therefore, midway through the test period, NACHA announced a full-blown corporate trade payment service available to any ACH user beginning January 1984.

The Marketing Failure

NACHA's press releases and statements implied that it expected widespread corporate acceptance of CTP, and thus rapid volume growth. The opposite has occurred. Current CTP transaction volume is insignificant—numbering only a few hundred transactions per month. Few companies other than pilot participants now use CTP and their volume is low. Prospects for growth, either in transaction volume or number of new users, are slim at best. And, few depository institutions actively market and support the CTP service.

Apparently recognizing that the CTP service is unlikely to succeed in its current form, NACHA recently announced an alternative called corporate trade exchange (CTX). The primary difference between the two services is that CTX provides variable-length records rather than a series of fixed-length 94-character records and supports a data content standard, ANSI X12.4.

The variable-length record eliminates message packing and unpacking costs and provides much more flexibility than the series of fixed-length records required in CTP.

Contemporary Trade Payment Practices

A look at the basics of contemporary trade payment practices helps to explain why CTP does not offer sufficient economic or technical incentives to attract businesses. When goods or services are provided to a business on credit, the vendor usually sends an invoice identifying the goods or service, stating credit terms, and requesting payment. To enable the vendor to update accounts receivable records and credit the payor's account, the payor usually provides a payment advice along with the check.¹ This

payment advice identifies the invoice or invoices being paid. In transactions with major suppliers, businesses commonly pay many invoices with a single check. Moreover, because the amount paid often differs from the amount invoiced, a remittance advice is necessary to indicate the reasons for the difference. Such information may account for discounts, corrections to the invoice, adjustments for freight, returns or damage, trade allowances, promotional rebates, and a variety of other contingencies.

An invoice sent to a business does not generally include a standard scannable return document for updating accounts receivable, as do retail invoices such as telephone or power bills. Even if the billing company provided a standard return document, the typical corporate payor using a computerized check creation system would not match a computer-prepared check with a standard return document, because this would entail costly manual handling. Thus, in a computer-based accounts payable system, the payor creates a remittance advice that identifies the check for the payee and explains the amount paid compared with the amount invoiced.

Retail Versus Wholesale Processing. Payee processing costs, which differ markedly for standard retail payments and vendor payments, are the key to determining the processing and information requirements for a corporate trade payment service. (Exhibit 1 outlines areas for potential savings.) Retail payments use a standard computer-processable return document that makes processing simple and keeps costs low. The payee or its processing agent opens the envelope, verifies the check amount against the return document amount, prepares the check for deposit, and uses the return document to update accounts receivable records. Often this processing is performed by a retail lockbox service, which produces a daily tape or some other electronic medium for input to a company's accounts receivable processing. The cost of a retail lockbox is low, typically no more than 10 cents for each payment "item" or transaction.

In contrast, wholesale payments ordinarily have no standard return document and are considerably more costly. The payment processing itself is more expensive—for example, it costs 30 to 50 cents per payment for the minimum wholesale lockbox service. Moreover,

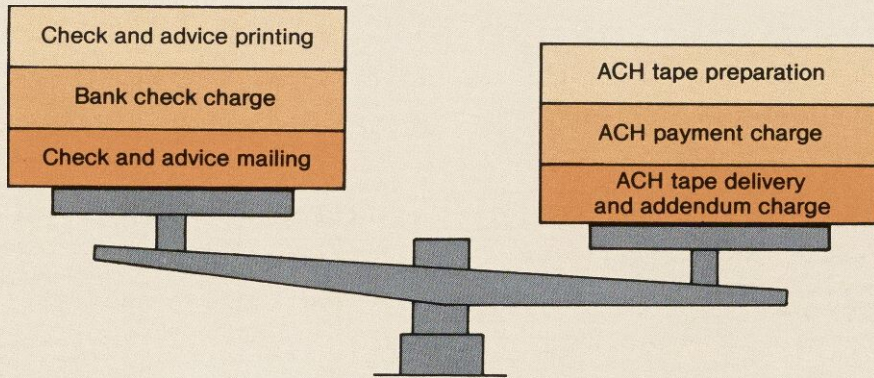
the payee's primary cost difference stems from processing the printed remittance information rather than the check payment itself.

The length and complexity of the payment advice determines actual keying costs; for a moderate length advice of 200 to 400 words, keying costs at least \$1, or about one-half cent per word. Furthermore, the absence of a standard format and data elements means that a skilled person must preprocess the return document to identify data content and structure it for keying. Typically such prekeying costs about \$1 per 100 words but can run substantially more for a long, complex invoice. Errors may arise both in the preliminary work that must be performed to organize remittance data for keying and in the data keying itself, raising costs still higher. Many companies find that error detection, resolution, and correction accounts for more than half the remittance processing costs for complex wholesale remittances. Thus, an electronic advice could cut payee costs by eliminating the need to rekey remittance data, reducing errors, and automating the accounts receivable processing.

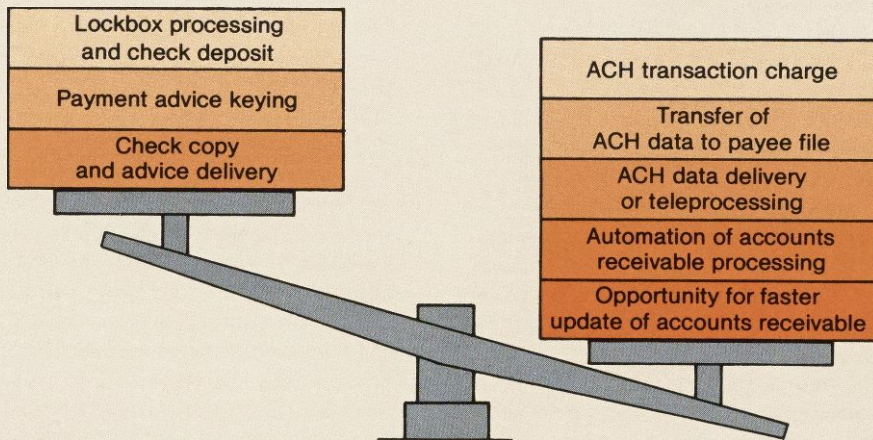
Providing the Remittance Advice. In contemporary payment practices, remittance advices are provided in three generic ways—a check-connected advice, a computer printout, and an electronic advice. When the advice is short, the advice information is attached physically to the check on perforated, check-size paper. The check and advice are sent in a single envelope to the payee or payee agent, who separates the two in processing the check. This check-connected advice is used for simple payments, for instance payment for a single invoice with straightforward adjustments such as discounts and returns.

A check-size addendum is too small to record all pertinent information in complex transactions. As an example, one check may be made for hundreds of invoices, each with a variety of adjustments and corrections. In this case, the check is usually appended to a computer printout and the two are mailed together. Sometimes, the check payment may simply refer to a remittance advice to follow. In this case, a hybrid of paper and electronic medium is often used. For instance, a check is sent to the company or its wholesale lockbox identifying an electronic advice that will follow. The payor then sends a tape, diskette or other

Exhibit 1 Savings Opportunities (Checks Versus ACH)



Payor Savings Opportunities



Payee Savings Opportunities

- The ACH data transfer involves very little work since both the payment transaction and addendum data are already in electronic form. The only processing is moving the ACH data from the bank file system to a user file, including possibly transfer to a tape or diskette if the data is not teleprocessed.
- Payment advice data may be keyed by the lockbox bank as a data capture service or the advices may simply be forwarded to the company for keying.
- ACH data may be physically delivered to payee if provided on tape or diskette and in this case involves costs comparable to delivery of check copies and remittance advices, for example, an overnight courier charge.

electronic medium giving details for a long addendum. The electronic advice saves printing costs for the paying company and keying costs for the payee.

Compatibility with ACH Processing. Because most large companies use automated check preparation systems, all the information necessary for an ACH payment already exists in computerized form. Therefore, companies presumably could switch from check-based payment to ACH payment with minimal effort. Rather than incurring the cost of creating the check and advice, the company would deliver a tape or teleprocess pertinent data to its financial institution.

Benefits of Corporate Trade Payments

If an ACH service is to replace checks for corporate trade payments, its net benefits must provide both payor and payee an acceptable return on investment to justify the costs of running a hybrid check-ACH payment system. Exhibit 1 summarizes savings opportunities for payor and payee.

Payor Benefits. For the payor, benefits are straightforward and modest. Savings are achieved from any reduction in bank payment charges and the elimination of mailing costs (postage, envelope, and related envelope processing and handling). The maximum savings is probably 20 to 25 cents for each transaction (Exhibit 2). In most cases, savings will be less, and the transaction could even cost more for a long advice because of the relatively high charge of one-tenth of a cent per addendum record. For instance, 415 addendum records would require an additional 40 cents beyond the basic CTP electronic mail delivery charge. This compares with 22 cents in first-class postage for mailing the same data. Although it may cost the payor more, the long remittance advice holds great potential for payee savings, which could offset the additional message costs to the payor. If such payee savings exceed incremental payor costs, and if the payee shares the savings with the payor via credit terms or price rebates for electronic delivery, then long remittances may be viable within a CTP system.

Payee Benefits. In nearly all vendor payment situations, the payee's administrative savings are greater than the payor's. However, the payee's benefits and costs are more difficult to

quantify, owing to the wide range of payee processing options and associated costs. First, processing costs depend heavily on the mode of collection—wholesale lockbox versus internal company collection and processing. Second, a broad array of possible data capture costs are linked to the complexity of the remittance advice and the extent to which critical data (such as an invoice number, vendor number or even payor bank account number) can drive the accounts receivable processing.

CTP clearly was not designed for simple, single-invoice payments, especially since the service has a minimum charge for the 94-character addenda records and an associated fixed cost for every CTP transaction. For simple, single-invoice remittance advices, the payee has little incentive to change from mailed check payments with a printed advice. For complex remittance advices, however, the potential savings from having data delivered electronically rather than through a printed advice are dramatic. Even greater benefits derive from avoiding rekeying of the remittance information and from automating accounts receivable processing through a standard code for data elements. In both cases, human error is reduced significantly.

Electronic delivery refers to any computer-readable medium that obviates the need for rekeying. The data could be teleprocessed or delivered by means of a tape or disk (diskette); however, a printout prepared by the receiving depository institution does not constitute an electronic medium. Providing a printout of the addendum data would nullify the potential savings from avoiding rekeying. Moreover, because it is virtually impossible for a human processor to read and efficiently key a data structure and content code such as ANSI X12, a printout with CTX would eliminate the potential benefits of automated accounts receivable processing as well as the savings from not rekeying.

Automated processing requires a standard data code for the remittance advice elements so that the payee's software can read and process the remittance. Such a standard eliminates the need for a human to identify data content, a usual requirement in most paper-based systems today. With check payments, for example, an accounts receivable clerk usually keys data elements of the remittance

Exhibit 2

Inter-ACH Corporate Trade Payments Payor Savings and New Payor Costs and the Most Economical Record Size

<u>Payor Savings</u>	<u>Cents</u>	<u>New Payor Costs</u>	<u>Cents</u>
Elimination of check and advice printing	.01	Per item delivery of tape to ACH	.04
Bank Check	.30	Bank ACH transaction origination charge ²	.20
Elimination of mailing of check and advice ¹	.25	ACH addendum charge beyond 15 records where R is the number of addendum records ³	.01 (R - 15)
TOTAL PAYOR SAVINGS	.56	TOTAL NEW COSTS	.24 + .01 (R - 15)

Net Payor Benefit

$$\begin{aligned}
 \text{Net payor benefit} &= \text{payor savings} - \text{new payor costs} \\
 &= .56 - [.24 + .02 (R - 15)] \\
 &= .32 - .02 (R - 15)
 \end{aligned}$$

The Maximum Economical Record Size

The maximum economical record size is obtained by setting the net payor benefit equal to zero and solving for the corresponding value of R. This gives:

$$\begin{aligned}
 0 &= .32 - .02 (R - 15) \\
 R &= 15 + .32/.02 = 31
 \end{aligned}$$

Conclusion

Given the current ACH charges, a typical payor would find the ACH more expensive than check payment whenever the number of addendum records exceeded 31.

Notes

- ¹ Includes postage, envelope stock, and an estimate of per item delivery to the post office.
- ² The estimate of the ACH origination charge for inter-ACH items is subject to bank markups over the 7.5 cent charge for an inter-ACH CTP transaction. The key point here is that this charge is 10 cents **less** than the assumed cost of a bank check.
- ³ This analysis assumes a charge of .02 cents per inter-ACH addendum record—the current Fed charge. If banks mark up the Fed charge, then the maximum economic record size would be even lower than shown here. For instance, if banks were to charge .4 cents per inter-ACH addendum record in excess of 15, then the maximum economic record size would fall to 23.

Exhibit 3

Major Components of a Trade Payments Processing Service

Company Input Processing	A company tape or other source of input must be validated and put in the CTP format.
Network Transmission	Formatted input must be transmitted from the originating ACH processor to the receiving processor.
Collection and Settlement	Funds must be removed from the payor's account and credited to the payee's account.
Payee Output Processing	The payment and remittance data must be processed by the receiving depository institution and delivered to the payee company in a usable form.

advice into appropriate fields within a standard data format compatible with a particular company's accounts receivable processing system.

Standards already exist for electronic data interchange of remittance information between businesses. Some industries (like grocery and transportation) have industry-specific standards while others such as the automotive industry are now establishing industry-specific systems based on the general purpose ANSI X12 standard. The payor and payee can even use customized standards when they transact sufficient volume.

Network Requirements

If the network offering a remittance transmission service functions primarily as an electronic mail service—that is, performing pure data transmission from payor to payee—its requirements are simple: the payee or processing agent must receive the data electronically and must possess accounts receivable processing software that accommodates the data format, data structure, and data content dictionary used by the payor (Exhibit 3). In a straightforward electronic mail service, the network merely provides a way to identify the data and content standard when the users employ multiple formats, data structures or content standards. In effect, the data envelope must specify the "language," or the standard, of the electronic letter.

Since electronic delivery from the receiving bank to the payee is crucial in payor-originated trade payments, the receiving bank is the key player in a CTP service. This contrasts markedly with ordinary ACH transactions, in which the originating institution tends to be the active servicing agent. With a CTP-type service, the receiving institution must be equipped to offer a flexible array of electronic delivery services to payee clients. Otherwise, little hope exists for a viable trade payment service.

Explaining CTP's Failure

The failure of CTP is commonly blamed on one of four factors: (1) the difficulty and cost of converting from check-based to ACH-based payment, (2) loss of check float, (3) the absence of significant bank marketing and other support, and (4) use of a fixed-record format for the addendum (as previously discussed). Each of these arguments is incorrect or, at best, inadequate.

Conversion Difficulty. The contention that companies need time to convert to ACH-based payment is questionable. As already noted, most companies have a computer-based system for preparing checks and addendum information. Generally, both procedures are driven by a tape or tape-like file that feeds into a print processor; therefore, the data required for ACH transactions that a company would forward

to its originating depository institution are already available in computer-readable form. Moreover, the data usually are organized so that converting them from the check printing to the tape creation step should present no difficulty. The programming needed to effect such a change is minimal, requiring at most a week of work. In fact, using CTP via the ACH would ultimately reduce the effort and cost of creating payment and remittance advices, because a firm can produce and deliver a tape (or teleprocess a tape-like file) with greater ease and economy than it can run a check and remittance advice printing operation.

Any company with a check creation system based on computers is technically able to switch to corporate trade payments with very little programming effort and cost. Given the ease of conversion, firms must either lack incentive to use corporate trade payments or else they must be deterred by barriers other than conversion time and cost.

Check Float. A more plausible explanation for CTP's marketing failure involves companies' potential loss of check float—the time delay between release of the check and its presentation against the paying company's bank account. Check payment float consists of three components: mail time, recipient processing time, and check collection time. Typical check collection times take roughly one day, while ACH items entail a one-day delay. Thus, if electronic payment is initiated at the same time a corresponding check is mailed, using the ACH alternative will cause a company to lose the mail and processing float (see Box, p. 18).

Proponents of the check float argument assert that the financial gain from float surpasses any savings from the ACH. However, the accompanying box, which compares numbers, indicates that net float opportunity is actually insignificant when both payor and payee are considered. Hence, it seems that check float alone cannot account for the CTP service's failure.

Yet the float explanation contains a germ of truth. As designed, corporate trade payments promise virtually no administrative or other benefits to the payor aside from savings derived from replacing check and advice printing with tape creation and from eliminating mailing costs. Therefore, if float is lost, the paying company gains no net benefit from automating.

Most potential benefits accrue directly to the payee to the extent that remittance processing costs are reduced. Thus, the payor's incentive must arise from mechanisms for sharing the payee's savings, such as changed credit terms for electronic payment, later payments or price rebates.² But without electronic delivery to save keying in and standards to allow automated remittance processing, the payee receives no significant benefit. When there are no savings to pass on to the payor and when no rationale exists for offering better credit terms, CTP becomes merely a float loss situation for the payor. The fact that CTP is so often criticized due to float loss reflects a failure to educate the market about potential administrative savings and net benefit sharing mechanisms.

The check-float obstacle is really just a symptom of corporate trade payments' larger problem—the absence of sizable savings. Even if check float were not an issue, CTP would still fail since it offers neither significant savings nor other features that make it clearly superior to check-based payment.

Bank Marketing Support. The lack of bank marketing support for CTP, like the check-float problem, is symptomatic. Financial institutions will invest in a marketing effort only if they believe that enough business exists to provide a return. Clearly, banks judge that CTP lacks attractive volume or margin potential.

The CTP product focuses exclusively on the ACH network's capability, ignoring processing required by banks. For instance, the service specifies no standard method for the receiving bank to deliver data electronically to the receiving company. Yet such data delivery is necessary for attaining the single largest source of payor-payee savings, as well as being a necessary step for saving the payee processing costs—eliminating the rekeying and relating processing of remittance advice data.

Record Format and Content Standards. The use of a series of 94-character addenda records has been widely criticized. This semi-fixed format is more costly and much less flexible than a variable-length message structure.³ Moreover, charging for at least 15 of the 94-character records makes the message price seem prohibitively expensive for short remittance advices, especially those involving fewer than 100 characters.

Float—A Barrier to CTP?

Most payment float is a zero-sum game: a payor's disbursement float increases at the payee's cost, for it results in an equivalent extension in the time delay until the payee receives good funds (collection float time). A positive-sum float situation arises from clearing system slippage; that is, good funds usage is granted to the payee faster than funds are charged against the payor. For instance, if the payee receives one-day availability in depositing a check but the payor's account is not charged for two business days, then there is one day of clearing system slippage. This slippage can sometimes be traced to Federal Reserve float, which occurs when the Fed grants availability to a depositing bank faster than it collects from either the drawee bank or that bank's collection agent. The source of slippage also could be other payment system processors, as when a depositing bank grants funds availability faster than it can consistently collect in its direct send program. Similarly, the slippage could be caused by a correspondent bank that is slow in its processing, or a drawee bank that is slow in posting presented checks. The latter, though rare, occurs when a controlled disbursing bank receives a late check presentment and does not charge the drawee bank until the next business day.

Fully Priced Versus Unpriced and Underpriced Float

The Federal Reserve has reduced its float dramatically to a small fraction of the level six years ago, and has effectively priced the remainder. The issue is whether that remaining Fed float is underpriced or misallocated away from the payor and payee.

Most bank float is priced in some way. For instance, a lockbox processing bank may grant a premium availability schedule but also charge a premium price to cover occasional slippage. In fact, a study of lockbox banks shows that most collect checks faster on average than the availability granted. The net slippage across lockbox processing banks is negative and not generally a net float benefit to payor or payee. Similarly, a controlled disbursement bank that accommodates late presentment will charge for this service in some way. The charge may be reflected in the analysis statement so the paying company must return funds to the paying bank equivalent to the effective loan. In many cases, an additional charge will be levied for the loan and possibly a fee for this service.

In conclusion, virtually all clearing system slippage is priced in some way. The Fed prices float explicitly, while most deposit banks charge for slippage through a fee for deposit processing. Lockbox processors tend to use "float capture" for their net benefit, and drawee bank slippage, though unusual, is nearly always fully priced. Therefore, when both payor and payee are considered, check payment clearly no longer offers significant positive-sum float opportunity. The most common situation today is a zero-sum game between payor and payee—any gain in payor float involves an equal loss to the payee. With bank float capture, a negative-sum situation exists from the joint payor-payee viewpoint. Thus, when float is assessed from a joint payor-payee perspective, the majority of cases are either zero-sum or negative-sum situations. This means that float should not be a barrier to corporate trade payments.

Another format problem arises in relation to existing procedures for providing electronic delivery of lockbox data. The prevailing standard for lockbox data transmission by the Bank Administration Institute (BAI) uses an 80-character record. Thus, it is incompatible with the 94-character CTP records. For a bank already providing a company with lockbox data in the BAI standard, merging the company's CTP data into a single transmission in a single format is logical, since both will be used to update the company's accounts receivable. However, this can be achieved only if the CTP format is

transformed by the receiving bank into the BAI format. The absence of standard software or software designs to interface CTP data with lockbox data transmissions reflects a failure to relate the CTP service with existing services and processing procedures.

Closely related to the problem of record format is the issue of data content standards. The CTP service included no provision for a data content standard. Advocates of the ANSI X12 standards for business to business electronic data interchange, which uses variable-length records, have criticized CTP's fixed

length 94-character records for failing to take the existing standards into consideration. However, a number of possible standards exist; the real need is for a standard capability that allows a sender to identify standard-encoded data to the receiver.

Resolving the issue of format and data content standards is crucial for achieving the potential benefits of electronics. Format affects interface cost, processing efficiency, and ease of electronic delivery.

Criticism Synthesis. Of the four common explanations for the CTP failure, only record format and data content standards are valid. Conversion to electronic data is easy for computer-based payment preparation systems although the use of a particular format that requires the conversion can be costly. When both payor and payee float are viewed in the context of net benefits, float in itself is not a significant problem. Bank marketing and product support are important for the success of any electronic trade payment service; its absence, however, is not a primary cause for failure, but rather a symptom of a poor product. The crux of a viable product is the ability to provide real economic benefits; format and standards issues must be viewed in this context.

Prerequisites for Check Displacement

Before electronic corporate trade payments can displace checks, benefits to the originating and receiving companies must be large. The greater this benefit, the greater the economic incentive and the faster the rate of adoption. Likewise, originating and receiving depository institutions will be convinced to create and aggressively market an electronic payment service rather than check-based services only in the presence of a net benefit. For an originating depository institution, "net benefit" implies two things: first, the margin from its electronic service must exceed that from its check processing service; and, second, the CTP margin must surpass the check payment margin by enough to cover start-up costs, to make up for lost check volume, and to generate sufficient income to provide an adequate return on investment. In the case of a receiving depository institution, net economic benefit means that the margin from its electronic trade payment service must exceed the margin from its deposit processing service.

If any one of these three benefits is missing, the electronic trade payment service—CTP, CTX or other variations that may emerge—is doomed to failure. No amount of marketing can overcome a lack of substantial net benefits to the payor and payee. Moreover, because companies can access the ACH only through their banks, the service cannot succeed unless enough institutions—both major corporate banks and the banks that process trade payment deposits—create and actively market the service to their existing customers. If an electronic corporate trade payment service is to thrive, payment banks must promote it as preferable to the controlled disbursing service they already offer. Alternatively, the benefits an originating institution derives from CTP must be compelling enough to attract corporate service banks that do not engage in corporate check payment servicing. Controlled disbursing often relies on geographic advantage (that is, the originating banks' location). ACH origination is geographically neutral if input is teleprocessed, and even provides an advantage to nearby banks if a tape or other electronic storage medium is delivered physically by the company. Thus, CTP offers major corporate service banks not now active in controlled disbursement an opportunity to seek payment processing business.

Two factors suggest that banks generally anticipate no significant CTP origination business vis-a-vis check processing. First, most controlled disbursement banks have slighted CTP and instead have worked vigorously to retain their disbursement business even in the face of formidable obstacles (such as revised Federal Reserve check presentment times). Second, since the introduction of CTP, many banks have invested substantial amounts to create and market check-based controlled disbursing. For instance, several New York City banks have used affiliates in Delaware or elsewhere to enter this business. Hence, the major corporate service banks perceive that the combination of relative margin and volume for check-based controlled disbursing outweighs the potential of its CTP equivalent.

Importance of the Receiving Bank. In contrast with its passive role in other ACH services, the receiving institution is the key player in a CTP service. The benefits it can gain help account for this predominance. As noted earlier,

the major advantages of CTP arise from electronic capture of complex payment advice data, which avoids the data keying and errors associated with a printed advice. If the receiving institution is not equipped to provide electronic delivery to the payee in a standard format and with minimal delay, then most payor-payee benefits are lost. Even today, as during the NACHA pilot test, the payee commonly receives a printout of the electronic addendum data, which must then be rekeyed. The printout is often sent either through mail or courier, so it is received no faster than if it were processed at the same bank's wholesale lockbox. Moreover, in the absence of ACH standards for format and data content, the printout of the advice may be even harder to interpret and key than the usual corporate payment service.

Summary of CTP Prerequisites. The payor and payee can obtain significant benefits from the CTP service only if the remittance data are transmitted electronically to the payee in a form that allows automated processing. Fully electronic delivery requires active CTP service support from the receiving bank. Having to handle a printout of the payment advice cancels virtually all benefits and may even be more costly than the payor's printed advice. The paucity of lockbox banks that have elected to act as CTP receiving banks suggests that they view CTP's potential margin and business volume unfavorably.

Conclusions

The CTP service has failed in part because of the semi-fixed format that requires packing remittance advice information into a series of 94-character addenda records. Lack of a data content standard such as ANSI X12 also precludes the automation of accounts receivable. The CTX service addresses these two problems, and so, it seems to be a move in the right direction.

There are, however, profound issues that reach beyond variable-format messages and the data content standards. Eliminating the rekeying of advice data and automating accounts receivable updates are major sources of

savings for both payors and payees; therefore, the receiving bank's use of an electronic medium rather than a printout is crucial for cost-effectiveness. A printout of ANSI X12-formatted data will be of little value to the payee and could even make accounts receivable processing more difficult and costly, since this format is not designed to be read by a human.

If payee benefits are to be realized, receiving banks must provide timely electronic delivery to the receiving company. Unlike most current ACH uses, the success of a trade payment service depends on the willingness of receiving banks to assume an actively supportive role.

Finally, the central issue is economics. The cost of a CTX message must be competitive with transmission of advice data directly from payor to payee—for example, by mailing a tape or diskette or by a direct, computer to computer transmission (electronic mail). The current ACH message cost is expensive. Dramatic improvements in message processing efficiency are required to achieve a viable service. Only improvements such as these will convince companies that they can gain significant savings and that the ACH is the proper vehicle for such a service. Not only these improvements but systems enabling the receiving bank to provide electronic delivery are necessary to persuade banks that they can secure business volume and an adequate return through actively selling and supporting an electronic trade payment service.

Barriers to change will be reduced to the extent costs are reduced. Standard delivery systems and possibly delivery software should be provided to the receiving bank, to keep format conversions to a minimum.

These requirements for success suggest clearly that CTX is a step toward a viable trade payment service: it deals with two of the problems with CTP. Other major issues must be resolved, however, before the ACH can be expected to generate significant volume from trade payments. Electronic delivery is crucial. Processing software is desirable. General standard support is preferable to support specific to ANSI X12. Finally, lower message cost is essential.

NOTES

¹In this article, it is assumed that the payor company is the transaction originator. Most companies indicate that they are not prepared to allow the payee to debit their accounts given the relatively large dollars involved in most trade payments, the absence of payor controls within the CTP service itself, and the need to incorporate in both the payment amount and remittance advice a variety of adjustments to the nominal amounts being invoiced by the payee.

²See Hill and Wood (1983) and Hill and Ferguson (November 1985) for a discussion of how net benefits of electronic

payments can be shared between a buyer and seller by quoting credit terms and other benefit sharing devices.

³See Bernell K. Stone, "Desiderata for a Viable ACH," *Economic Review*, vol 71, no. 3 (March 1986), pp. 34-43 for a more thorough critique of the costs involved in the series of fixed-length addenda records and the reasons for a flexible message capability.

References

- Arthur D. Little, Inc. *Electronic Data Interchange for the Grocery Industry*, 1980. Cambridge, Massachusetts: Arthur D. Little, Inc., 1980.
- Carey, Kristen E., and Kevin Carr. "ACH Transaction Processing: An Overview of Information Flows and Controls," *Journal of Cash Management*, vol 2, no. 3 (September 1982), pp. 32-47.
- Corrigan, E. Gerald. "Federal Reserve System Pricing: An Overview," *Journal of Cash Management*, vol 2, no. 3 (September 1982), pp. 48-56.
- Doll, Dixon R. *Data Communications: Facilities, Networks, and System Designs*. New York: John Wiley and Sons, 1978.
- _____. "Topology and Transmission Rate Consideration in the Design of Centralized Computer-Communication Networks," *IEEE Transactions on Telecommunication Technology*, vol. COM-19, no. 3 (June 1971).
- Economic Review. Special Issue: Displacing the Check*, vol. 68, no. 8 (August 1983).
- Federal Reserve Bank of Atlanta, editor. *The Future of the U.S. Payments System*, proceedings of a conference sponsored by the Federal Reserve Bank of Atlanta, June 23-25, 1981. Atlanta: Federal Reserve Bank of Atlanta, 1981.
- _____. *Payments in the Financial Services Industry of the 1980's*, proceedings of a conference sponsored by the Federal Reserve Bank of Atlanta, September 22-23, 1983. Westport, Connecticut: Quorum Books, 1984.
- Gambs, Carl Melvin. *The Economics of An Automated Payment System*. Ph.D. Dissertation, Yale University, 1972.
- Hill, Ned C., and Daniel M. Ferguson. "Cash Flow Timeline Management: The Next Frontier of Cash Management," *Journal of Cash Management*, vol 5, no. 3 (May/June 1985), pp. 12-22.
- _____. "Negotiating Payment Terms in an Electronic Environment," working paper presented at the National Corporate Cash Management Association in New Orleans, Louisiana, November 1985.
- Hill, Ned C., and Robert A. Wood. "I'm O.K., You're O.K.: The Electronic Win-Win Deal," *Canadian Cash Management Review*, vol 4, no. 6 (September/October 1983), pp. 3-5.
- Johnson, Theodore O., and John M. French. "Electronic Corporate Payment Systems," *Journal of Cash Management*, vol 1, no. 1 (October 1981), pp. 26-34.
- Keenan, Gerald L. "ACH Return Items," *Economic Review*, vol 70, no. 3 (March 1986), p. 19.
- Liss, Ronald E. "The ANSI X12 Committee: A Status Report on Standards for Cash Cycle Management," *Journal of Cash Management*, vol 3, no. 4 (August/September 1982), pp. 39-48.
- National Automated Clearing House Association. *Operating Rules of the National Automated Clearing House Association*. Washington, D.C.: National Automated Clearing House Association, 1979.
- _____. *NACHA Corporate Trade Payments Notebook*. Washington, D.C.: National Automated Clearinghouse Association, 1983.
- Rawlings, Brown R. "Will the ACH Ever Grow Up?" *Transition*, vol 10, no. 10 (December 1982/January 1983), pp. 22-26.
- Smith, Samuel D. "The Current Status of Corporate EFT," *Journal of Cash Management*, vol 2, no. 2 (June 1982), pp. 28-40.
- _____. *An Assessment of Electronic Funds Transfer Systems to Meet the Needs of the Corporate Treasurer*. Thesis, Stonier Graduate School of Banking, Rutgers University, 1980.
- Stone, Bernell K. "Cash Cycle Management and the ANSI X12 Committee," *Journal of Cash Management*, vol 3, no. 4 (August/September 1983), pp. 37-38.
- _____. "Corporate Perspectives on Cash Management," in *Payments in the Financial Services Industry of the 1980s*, edited by Federal Reserve Bank of Atlanta. Westport, Connecticut: Quorum Books, 1984, pp. 40-58.
- _____. "Desiderata for a Viable ACH," *Economic Review*, vol 71, no. 3 (March 1986), pp. 34-43.
- Trotter, James W. "Is Corporate EFT Coming of Age?" *Journal of Cash Management*, vol 2, no. 3 (September 1982), pp. 22-29. This updates an earlier version of this article from *Computer Law Journal*, vol 11, no. 1 (Winter 1980).
- White, George C. "Electronic Banking and Its Impact on the Future," *Magazine of Bank Administration*, vol 55 (December 1979), pp. 39-42.
- _____. "EFT Opportunities for the Innovative Corporation" *Journal of Cash Management*, vol 2, no. 2 (June 1982), pp. 42-48.