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Paying Electronic Bills Electronically

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Electronic billing and payment systems are about to change the way many households pay their monthly bills. These systems are likely to increase consumer convenience and reduce billers' costs. Several factors, however, could slow down the widespread use of electronic billing and payment, including customer resistance to change, unequal access to technology, and consumer privacy concerns.

While consumers often use credit or debit cards to make retail purchases electronically, most recurring obligations, such as utility bills and installment loans, are paid from home with personal checks. This practice, however, may soon begin to change. Several electronic bill presentment and payment systems—"e-billing" systems—are under development or at an early stage of implementation. These systems automate both the delivery and the payment sides of the billing cycle: bills and account statements are delivered to customers over the Internet; customers then use their personal computers to review the bills and initiate payments. Developers of e-billing claim that by eliminating paper records and speeding up the billing process, these systems will produce cost savings for billers as well as added convenience for consumers.

In this edition of *Current Issues*, we describe how electronic billing and payment systems work and discuss the factors that will determine whether high-volume billers and their customers are likely to benefit sufficiently to join in large numbers. We begin by estimating the size of the market for processing recurring bills. We then examine how information exchanges and money flows under the current system of bill presentment and payment will change with the move to electronic systems, and consider who stands to gain if this payment innovation becomes popular. Finally, we look at some of the obstacles that may delay the adoption of e-billing.

What Is E-Billing, and Why Is It Being Developed?

E-billing systems shift the recurring bill presentment and payment process from a paper-based format to an electronic format.¹ Utility companies, merchants, and financial institutions can use these systems to transmit bills and account statements to their household and small business customers and to receive the returning payments and remittance information. The entire exchange takes place over the Internet. The payments themselves typically take the form of debits to a customer's checking account and are processed through the Automated Clearing House (ACH), a nationwide electronic network for transferring small-value payments among banks.² Payments can also take the form of postings to a credit card account.

To participate in these systems, a firm engages a system operator to present bills to its customers. The operator may post bills on its own interactive web site or on a web site belonging to the biller, the customer's bank, some other provider of financial services, or an Internet portal. From a household's perspective, the most convenient location for receiving and paying bills is the web site of the bank where it holds its checking account. First, a household will be able to view many, or even most, of its recurring bills at one Internet location. Second, it will be able to monitor its deposit account balance while reviewing and paying bills. From a biller's perspective, however, its own web site may be

preferable because of the opportunity to sell additional products and to cultivate customer loyalty.

To receive and pay bills electronically, a customer must make arrangements in advance with his or her bank, the biller's bank, or the system operator. The customer specifies which deposit account or credit card account should be drawn on to complete transactions. After making these arrangements, the customer can review billing statements on a computer screen and, if the posted charges are correct, the customer can "click" on a special icon to initiate an electronic payment for immediate processing or to schedule payment for a later date.

Once the transaction is initiated, the system operator routes the payment. Funds can be moved between banks by using the ACH network, a credit card network, or an alternative method for settling retail payments. The system operator closes the bill payment loop by sending remittance information to the biller in an electronic form for automated account reconciliation. This technology has the potential to deliver bills and secure payment more rapidly and at lower cost than paper-based systems relying on the mail.

Potential Market for E-Billing

The business of processing bills and payments is a behind-the-scenes economic activity that, upon close inspection, turns out to be surprisingly large. Estimates appearing in several trade reports place the number of recurring bills received and paid by households at approximately 16 billion annually.³ Utilities forwarding bills to their retail customers and financial intermediaries sending statements on credit card accounts, installment loans, and insurance policies generate the bulk of these mailings. The overwhelming majority of the ensuing payments are made with personal checks and remittance documents sent through the mail to the biller.

The significant cost of processing 16 billion standard bills each year has prompted several technology companies, including suppliers of computer hardware and software, telecommunications equipment, and payment processing services, to investigate ways to capture some of this business. Industry sources estimate that, on average, it costs a biller about \$.90 to print and mail a bill and to process a customer's personal check and remittance information.⁴ Given the number of bills that are prepared annually, the developers of e-billing systems are competing for a revenue stream of almost \$15 billion. Add to this figure households' out-of-pocket expenses of \$.32 per bill in first-class postage, and the total expenditure stream rises to about \$20 billion. Developers of e-billing systems have proposed offering their service to billers for about \$.32 per transaction, well below the average cost of \$.90 per bill

under the current system.⁵ In addition, the system operators agree that they themselves will not charge customers and that banks will be assessed at most a small fee. E-billers hope that this fee structure will encourage the participation of these two groups.

Comparisons with Current Electronic Payment Formats

E-billing is being promoted as a major improvement over current procedures for the electronic payment of bills. Today, a small number of customers pay utility bills and insurance premiums with a preauthorized posting to a credit card account or with a debit to a checking account. Preauthorized payments are obviously convenient—the customer does not need to initiate the payment of recurring bills each month. Nevertheless, this method of payment is not widely used because customers are reluctant to give up control over the timing and dollar amount of transactions. A recent survey estimated that in 1997 just 3.2 percent of recurring bills were paid using preauthorized debits to checking accounts.⁶

An additional 1.6 percent of recurring household bills are settled using electronic payments originated by telephone or a personal computer loaded with home banking software. By initiating each payment, customers retain control of the timing and amount, as is the case when paper checks are used. This approach, however, also has its disadvantages. Billers must continue to send out paper copies of bills every month, a costly process, and the remittance information is not returned along with the payment, making it difficult for billers to reconcile their accounts receivable. Electronic payments that do not include customer account information in a convenient form offer only limited benefits to billers, and companies have not actively promoted this approach.

Because of the resistance of both billers and customers to using existing automated systems, electronic bill payment has thus far achieved only limited popularity. The developers of e-billing maintain, however, that they have overcome the drawbacks to electronic bill payment in its current forms, and they are confident of achieving success in the market for electronic retail billing and payment processing.

How Does E-Billing Work?

E-billing systems work by eliminating the transfer of information stored electronically to paper and back again at key points in the billing and payment cycle. In addition, by maintaining information in electronic form throughout the cycle, the telecommunication of billing and payment information can replace the physical transportation of paper documents. In the current system,

paper documents are exchanged among participants four times over the cycle:

- Billers send account statements to customers.
- Customers return checks and remittance information to billers.
- Billers deposit checks at their banks.
- Billers' banks return checks to the banks on which the checks are drawn.

The first two exchanges are typically handled by the post office and the last two by courier services.

To examine in greater detail how e-billing works, we present a step-by-step description of the billing and payment process (see table). The table compares how each step is handled by the current system and by e-billing. The comparison allows us to pinpoint the sources of anticipated cost savings. First, e-billing eliminates the conversion of computerized information to and from paper that occurs in statement preparation and printing (step 1), the updating of customer accounts (step 5), and

the debiting and crediting of bank accounts (step 9). Second, electronic communications replace the physical delivery of documents that takes place in statement delivery to customer (step 2), return delivery to biller (step 4), check presentment at the Federal Reserve (step 6), and presentment at the paying bank (step 7).

In addition to offering direct cost savings by eliminating paper and postage, e-billing has the potential to reduce the time it takes to deliver bills and receive payments. The earlier the billers receive payment, the sooner they can invest the funds. The importance of this aspect of cash management has already led many high-volume billers to hire specialist firms for statement preparation, printing, and mailing. These specialists assist a biller in sending account statements through the mail at the lowest cost and with the quickest delivery. In addition, billers have accelerated collection by employing retail lock-box operators. These firms specialize in receiving and processing remittances, again with the objective of making funds available for investment as soon as possible.

Comparison of E-Billing and the Current Paper-Based System for Billing and Payment

Step	Paper-Based System	E-Billing
1 Statement preparation	The biller prints account statements from an electronic database and forwards them to the post office.	The biller generates a computer file containing billing information and forwards it to the system operator.
2 Delivery to customer	The post office physically delivers bills to customers' mailboxes.	The system operator forwards electronic bills to customers' banks for posting on the banks' web sites.*
3 Payment initiation	Customers review bills, write personal checks, attach remittance information, and mail checks to billers.	Customers review bills and initiate electronic payments; remittance information and payment are automatically returned to the system operator.
4 Return delivery to biller	The post office delivers personal checks and remittance information to the biller's mailbox.	The system operator returns to the biller a computer file indicating which bills are being paid.
5 Updating customer accounts	The biller opens envelopes, updates an electronic database of customer accounts, and deposits checks with its bank.	Using the computer file provided by the system operator, the biller updates an electronic database of customer accounts.
6 Presentment at the Federal Reserve	The bank gives the biller provisional credit for deposited checks and delivers them to the Federal Reserve for processing.**	The system operator forwards payment instructions to the Federal Reserve's automated clearinghouse.***
7 Presentment at paying banks	The Federal Reserve sorts customers' checks and presents them to the appropriate banks.	Through the automated clearinghouse, the Federal Reserve notifies customers' banks of the debits to make.
8 Interbank settlement	The Federal Reserve debits the reserve accounts of the customers' banks and credits the account of the biller's bank.	The Federal Reserve debits the reserve accounts of the customers' banks and credits the account of the biller's bank.
9 Debiting and crediting of bank accounts	The bank accounts of customers are debited, and the biller's account is credited, according to the information on the paper checks.	The bank accounts of customers are debited, and the biller's account is credited, according to the information in electronic files.

*Alternatively, the billing information could be sent to the biller's web site.

**A local clearinghouse could be used instead.

***There are, however, other means to settle the transaction electronically.

E-billing can be expected to speed up the collection of funds even further. First, the delivery of bills and remittances is not subject to delays in the mail. Second, funds flow electronically from the customer to the biller, eliminating the time lag associated with the exchange of checks between banks. By collecting funds sooner, a biller can earn additional interest income and supplement the direct cost savings realized through e-billing.

Distribution of Economic Benefits

As we have seen, e-billing entails a total restructuring of the billing process. Accordingly, the participants in that process will change, along with the revenue each participant can expect to earn. If e-billing is adopted on a large scale, the main beneficiaries will naturally be the system operators, who stand to earn sizable revenues and potentially high profits on their investment. In the remainder of this section, we look more closely at the effects of e-billing adoption on other participants—including billers, households, commercial banks, and the post office.

Billers

When the public becomes familiar with e-billing and participation has broadened, the average cost of presenting and collecting a bill electronically is expected to drop to about \$.32. Billers accustomed to paying \$.90 under the current paper-based system will clearly benefit if a large portion of their customers stop paying bills with personal checks. But given the historical resistance of individuals to banking innovations such as automated teller machines (ATMs) and debit cards, it is unlikely that a large share of a biller's customers would immediately forgo writing checks. Therefore, in deciding whether to be an early participant in e-billing, a biller must make cost comparisons assuming that only a limited number of consumers will use the service initially. The per bill cost of providing select customers with e-billing services could be well above the per bill cost when adoption is widespread, eliminating most, if not all, of the savings in the short run.

But even if acceptance is limited at first, billers may realize sufficient indirect benefits to make early participation worthwhile. As noted above, the speedier collection of funds under e-billing allows billers to invest the proceeds more promptly and thus to earn additional interest (assuming that customers do not change their payment patterns when using e-billing). For example, if each of twelve monthly payments of \$170 (the estimated average size of a recurring bill) is received six days earlier, a biller could earn additional interest of \$1.64 per account per year, or something on the order of \$.10 to \$.14 per payment (*Bank Network News* 1998).

This gain from faster collection could tip the scale in favor of e-billing even if limited use of these systems kept the initial per bill cost high—or even if the volume discounts offered by statement processors and lock-box operators brought the cost of paper presentment closer to the \$.32 fee for electronic presentment.

Finally, in today's highly competitive marketplace, billers must consider customer retention. Because the cost of acquiring new accounts is high, firms may be willing to bear the added expense of providing some extra benefits in order to solidify existing customer relationships. As a result, billers may offer e-billing as a payment option even if it is more costly than the traditional billing process.

Households

An e-billing service should prove attractive to households that already own personal computers and have Internet access. At the very least, these households would save postage. In addition, households that pay their banks an account activity fee based on the number of checks written per month would eliminate this expense. (It is possible that banks will eventually charge their customers for bills presented and paid electronically at their web site, but this assessment has not been discussed to our knowledge.) But while households will value a reduction in their out-of-pocket costs, they may attach even more importance to the convenience of reviewing and paying bills electronically in a few easy steps.

Like billers, households must also consider the indirect benefits of e-billing. Because the time of payment receipt is more predictable under an electronic system than under a paper-based system, households could pay bills closer to the due date and still avoid late fees. By paying their bills later in the cycle, these households would maintain higher average balances in their bank accounts and thus earn additional interest. Such a change in customer behavior would mean, however, that the additional interest sought by billers under an electronic billing system could instead accrue to their customers.

Commercial Banks, the Post Office, and Other Participants

The overall impact of e-billing on commercial banks is unclear. Because banks operate retail lock-box and check-processing businesses, they could end up losing revenue to e-billing operators. E-billing, however, may prove to be a key application that leads depositors to curtail visits to bank branches and to perform more of their banking electronically. If banks can shrink their branch networks, they will lower their cost structure and perhaps be able to operate more efficiently in the long run.

Other companies that operate payments-related businesses stand to lose a share of their income as e-billing gains popularity. The post office, for example, would see a fall in the volume of first-class mail if bill presentment and payment were completed electronically. Producers of bills and account statements may stay in operation, but the nature of their business would have to change. Rather than deliver envelopes to the post office, they would need to transfer data files to an e-billing operator. Manufacturers of high-speed statement printing and sorting equipment, however, would surely see a reduction in their sales.

Is E-Billing Viable?

For both billers and their customers, realizing the benefits of e-billing will depend on how extensively the service is used, or on what is referred to in the economics literature as “network effects.”⁷ That is, the value of joining a network rises as the number of participants increases. Consider the telephone system: the utility of telephone service to a potential subscriber depends upon the number of other households and businesses connected to the system. If only a few people were connected to the telephone network, a potential new subscriber might not view the service as having much utility, whereas if virtually everyone could be reached over the telephone network, the service would appear to have high utility. In the case of e-billing systems, the developers face a two-sided challenge. First, they must draw a sufficiently large group of billers to make the service valuable to a typical household. Second, they must create interest among a large enough group of households to make e-billing attractive to a typical biller.

To meet this dual challenge, the developers of e-billing systems must overcome some obstacles, including the following:

Incompatibility of competing systems. If rival e-billing systems are in operation, billers may not join the same system as their customers’ banks, making bill presentment impossible. This obstacle, however, can probably be overcome in several ways. As a service to both billers and customers, banks could join all the major e-billing systems, as is the case now when banks join more than one credit card or ATM network. Alternatively, billers could participate in all major e-billing systems so that every customer could receive bills electronically and make payments regardless of which system the customer’s bank has joined. Finally, major e-billing systems could cooperate by exchanging billing information and payment instructions.

Unequal access to technology. For households that do not already own a personal computer, the cost of

purchasing this equipment and monthly Internet access could be a deterrent to participating in an e-billing system. Some trends, however, suggest that this barrier will decline in importance over time. The cost of personal computers continues to fall, and very inexpensive models that are specifically designed to provide Internet access are now becoming available. In addition, to reach households that cannot connect to the Internet at home, banks will most likely make e-billing available through personal computers and ATMs placed in branches and off-site locations such as retail outlets.

Privacy Concerns. If households believe that e-billing permits companies to create detailed databases on their spending patterns, they may be reluctant to adopt this payment innovation. To address such concerns, banks may find it necessary to disclose fully who will have access to information and how it might be used. Banks may also need to convince customers that personal information will be secure from hackers both when it is stored on bank computers and when it flows over the Internet. Banks and e-billing operators have already taken steps to protect customer information from hackers: a password is required for account access, and sophisticated encryption technology scrambles all communications between the banks and their customers.

Conclusion

By taking paper and postage out of the process of distributing bills and processing remittances, e-billing has the potential to generate cost savings and other important benefits for both businesses and households. Even though billers will realize a large portion of the initial cost savings, consumers should capture all of the savings in the longer run. Competition in the marketplace will ensure that billers’ cost reductions translate into lower prices for the goods and services provided to customers.

From the banking perspective, e-billing supports the industry’s ongoing efforts to provide improved payment services. Wholesale payment services are already largely electronic, so it stands to reason that banks would want to be closely involved in the development of an electronic format for retail payments.

Some customers, billers, and banks are already expressing interest in e-billing systems, but it is still too early to know how rapidly and widely the technology will be adopted. Households have shown considerable inertia in adopting new payment methods, especially when the existing ones still work. Nonetheless, the number of computers in homes is rapidly increasing, and consumers may respond more favorably than expected to a technology that makes bill payment very easy.

Notes

1. The system operator will not be a bank, but a technology company that specializes in processing transactions for financial institutions. Several firms, individually or in alliances, are developing e-billing technology, including First Data Corporation and Microsoft (<http://www.msfdc.com>), CheckFree (<http://www.checkfree.com>), Princeton TeleCom (<http://www.princetontele.com>), CyberCash (<http://www.cybercash.com>), and Visa (<http://www.visa.com>). In most cases, the web sites of these companies provide information about their specific approaches to e-billing. Currently, billers do not seem to prefer the technology of any one company, and in the longer run two or more competing systems may coexist, as is the case with credit card and automated teller machine systems.

2. The operators of the network are the Federal Reserve, New York Automated Clearing House, Visa USA, and the Arizona Clearing House. The ACH network is governed by ACH operating rules. For more information, see the National Automated Clearing House Association (NACHA) web site (<http://www.nacha.org>). NACHA has also taken steps in partnership with industry groups to establish business practice standards for e-billing and plans to work on issues such as the compatibility of competing systems, error resolution, privacy and confidentiality, and accuracy.

3. See U.S. Department of Commerce (1998, p. 36), Orr (1997), and Craft and Johnson (1997).

4. Several industry sources estimate that the average cost of preparing, printing, and mailing a monthly account statement is in the range of \$.50 to \$1.50. In addition, the cost of using a retail lock-box service (a service specializing in processing the remittance information and checks sent by customers) is estimated to be between \$.10 and \$.25. The relatively wide range in cost may reflect differences in unit costs for large and small billers and differences in the way the cost estimates were made. For more information, see Orr (1997), Craft and Johnson (1997), Kerstetter (1998), and Dalton (1998).

5. See *Bank Network News* (1998).

6. See *Bank Network News* (1998).

7. For an overview, see Economides (1996). For a discussion of the concept of critical mass in the adoption of network technology, see Economides and Himmelberg (1995). Shapiro and Varian (1998) discuss several features of information processing over electronic networks.

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