Electronic bill presentment and payment—Is it just a click away?

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Introduction and summary

This article concerns electronic bill presentment and payment (EBPP) in the business-to-consumer (B2C) marketplace and, more specifically, remote bill payments (as opposed to payments made at the point of sale). B2C EBPP applications are plausibly among the most promising innovations to shift U.S. consumer payments from checks to electronic alternatives. By EBPP, we mean the electronic bill presentment to the consumer and the electronic initiation of payment by the consumer. Some analysts have suggested that electronic delivery of bills will increase the use of electronic payments. Our research attempts to answer the following two questions: Why aren't electronically presented bills always paid electronically? And, if EBPP does aid in the migration to fully electronic end-to-end payment, what are the barriers to its adoption?

While the U.S. continues to lead the world in technological advancements such as the development and widespread use of the computer and Internet technologies, Americans still rely on checks to make most payments. The U.S. has higher check usage per capita than any other industrialized country. Humphrey, Pulley, and Vesala (2000) state that U.S. consumers and businesses write around 20 checks per month. This is more than 2.8 times the number of checks written per person in Canada, France, or the UK and at least 20 times more per person than in Germany, Japan, Italy, Belgium, the Netherlands, Sweden, or Switzerland.

In 1999, U.S. businesses and consumers issued a total of 68 billion checks (BIS, 2001). The proportion of check usage is highest for remote payments. Of the 15 billion to 17 billion consumer bills issued every year, over 80 percent are paid by check (Kerr and Litan, 2000). If EBPP were to capture the whole consumer market and convert all check payments into electronic ones, the number of checks written by consumers would be reduced by over 40 percent.

Today, most consumers still receive their bills via mail. With today's technology, bills may be presented via the Internet, mobile phone, or personal digital assistant anywhere in the world, allowing for greater convenience to consumers. However, how much, if anything, most consumers are willing to pay for such a service remains unclear. Greater convenience, along with value-added services such as better customer service, account aggregation, and other incentives may be required to achieve the number of consumers necessary for billers to provide EBPP services.

In the next section, we explore how most traditional bills are presented and paid. Then, we discuss the various EBPP models and what enhancements to existing payment choices may be necessary for Internet- and e-mail-initiated transactions. Next, we consider the various payment options available for EBPP; and finally, we outline barriers to market adoption of EBPP services.

Traditional bill presentment and payment

Below, we discuss the costs and benefits of the traditional bill presentment and payment process. Industry participants estimate that billers issued between 15 billion and 17 billion consumer bills in 2000. Over 80 percent of these bills were originated by one of four industry groups: finance, insurance, telecommunications, and utilities. Billers and consumers pay $80

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billion annually for bill presentment and payment.[1] Internal operations for bill and payment processing cost billers $45 billion yearly, with almost two-thirds ($30 billion) of that going to technology vendors for hardware and software implementation and support. The remaining $35 billion comprises $10.7 billion for postage; $8 billion for account fees at financial institutions; $7.5 billion for insufficient fund fees; $5.7 billion for outsource bill/payment processing; $2.2 billion for check clearing fees; and $0.9 billion for ACH (automated clearing house)/credit card processing and settlement fees (Whaling, 2000a).

Bill presentment

Traditional consumer bill presentment and payment is a paper-based process that involves presenting the consumer with a paper bill for goods or services previously rendered, which the consumer pays by check. The bill presentment process involves billing operations, such as generating, printing, mailing, and delivery of bills to consumers.[2] The cost of processing, printing, and sending bills can range from $.70 to $1.50 (PayAnyBill, 2000). In other words, billers spend between $10.5 billion and $25.5 billion each year to present bills.[3]

The traditional bill presentment process involves not only the biller generating a periodic report from its billing systems, but also the subsequent notification of the bill to the consumer for goods or services previously rendered. Paper-based billing is an intricate and time-consuming process that involves printing account statements, stuffing them into envelopes (along with appropriate advertising inserts and other marketing material), and sorting for mailing. Depending upon the level of automation, the creation and processing of bills can take anywhere from one to three days (Doculabs, 1999). In the traditional bill payment world, notification and presentment of a bill occur simultaneously when the consumer receives the bill in their mailbox. For most bills today, the post office serves as a notification and presentment network by delivering each statement from each biller individually to each customer. The average bill takes three to five days to reach the consumer.

Most billers have streamlined and improved their paper-based billing operations as much as possible. However, the traditional billing process still faces issues of convenience, timeliness, cost, and reliability. Traditional billing does not allow consumers to receive their bills anytime and anywhere. Furthermore, errors in customers' addresses (which are common when customers relocate) may lead to significantly longer delivery times. The process of printing bills, assembling bills, and delivering bills is time-consuming and costly to billers since it is resource intensive. Traditional billing also lacks reliability because paper-based billing systems offer no guaranteed delivery mechanism. Furthermore, lost bills result in customer service problems and late fees for consumers.

Bill payment

The bill payment process involves at least five main participants: the consumer, the consumer's financial institution, the biller, its financial institution, and a payment network (see figure 1). The consumer will ultimately use funds on deposit at their financial institution to settle the monetary obligation. In the case of check, debit card, or ACH payments, the consumer will have to deposit the funds into their account before initiating payment to the biller.[4] The biller's financial institution will present the consumer's payment obligation through a payment network that processes checks, ACH payments, credit cards, or debit cards. The consumer's financial institution will send funds via the network to the biller's financial institution if sufficient funds are in the payee's account (or if the payee has a sufficient line of credit). The advantages and disadvantages of each network are well known.[5]

Electronic bill presentment and payment

In contrast to the traditional model, EBPP no longer uses the mail system as a delivery mechanism for bill presentment and payment initiation. Instead, it uses the Internet as a speedier and less expensive delivery infrastructure to present bills electronically.[6] With the percentage of U.S. households with Internet access having increased from 26.2 percent to 41.5 percent between December 1998 and August 2000 (U.S. Department of Commerce, 2000), Internet access to bill presentment and payment options is on the rise.

Consumer and biller expectations

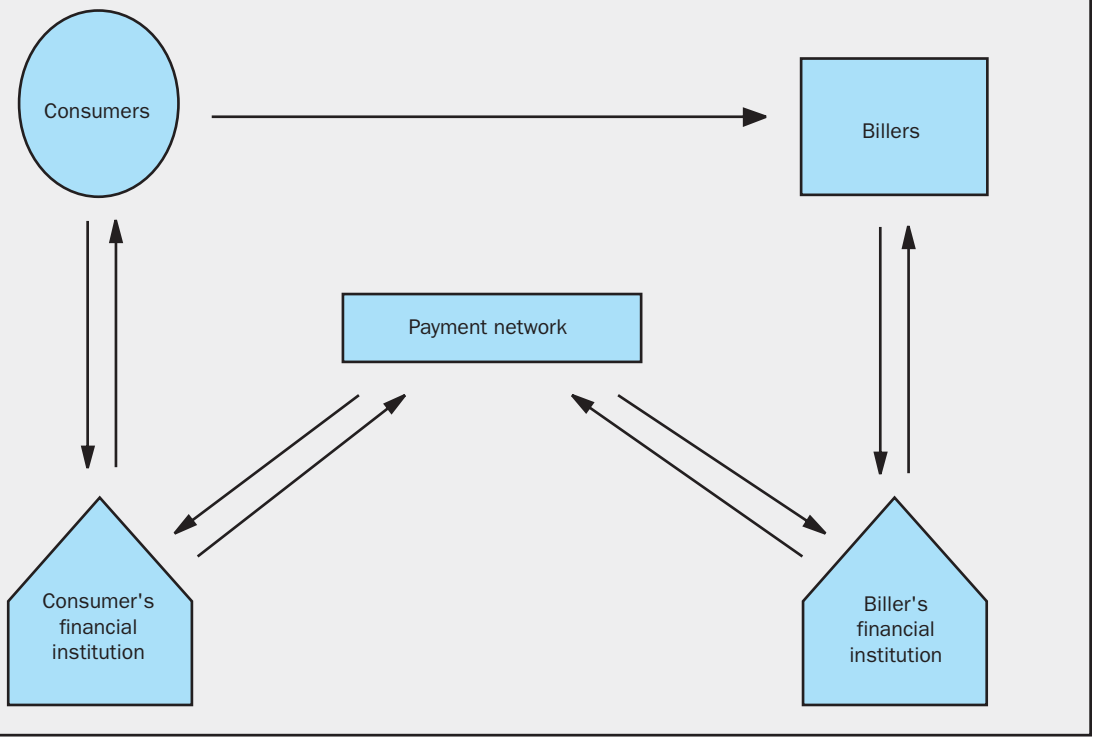
Compared with the traditional bill delivery and payment methods, EBPP seeks to meet or exceed the sometimes competing expectations of consumers and billers.

Consumer expectations

- *Convenience*—Consumers do not view the traditional payment methods as overly burdensome and would expect any new bill payment procedure to meet or improve on this convenience before switching.
- *Time/cost savings*—Consumers would expect to have costs that are just as low (or even lower) than their current bill paying costs.
- *Control over payments*—As with the use of checks, with EBPP consumers would expect to have control over the timing and amount of payments.

FIGURE 1

Bill payment



- *Universal payment mechanisms*—Because electronic payments are replacing the check, consumers would expect to have a wide range of electronic payment options that meet their specific payment needs or wishes.
- *Privacy and security*—Consumers must be confident that any bill payment process will protect their privacy and funds by securely transferring billing information and payments.
- *Reliability*—Consumers must trust the accuracy of their electronic bills and feel confident that their payments will be delivered accurately and on time.
- *Dispute resolution*—Consumers need reliable and accessible customer service options to resolve any questionable transactions.

Biller expectations

- *Cost reductions*—Billers want a bill creation and payment process that is less costly or, at least, no more costly than the current paper-based billing process.
- *Dispute resolution mechanism*—Billers require an accessible and cost-efficient dispute resolution procedure.
- *Reliable delivery mechanism*—Billers want a fast and reliable delivery mechanism for both presentment and payment.
- *Ability to up-sell and cross-sell*—Billers want to employ specialized, targeted marketing techniques, rather than general paper statement stuffers that may not be suitable for each consumer.
- *Control over customer data*—Billers want to protect and safeguard their most valuable data.
- *Broad distribution/reach*—Billers require a broad delivery and payment medium to gain maximum customer use.

EBPP presentment models

The two primary EBPP models are the biller-direct model and the consolidation/aggregation model. There are a number of variations of the consolidation/aggregation model, including e-mail-based EBPP, the use of personal financial management software, screen scraping, and scan and pay methods. The notification procedure for both the biller-direct and the consolidation/aggregation models involves the biller notifying the customer of a pending bill, generally via e-mail, and the customer subsequently logging onto either the biller's or consolidator/aggregator's website (see figure 2).

Biller-direct model

In the biller-direct model, once a consumer has enrolled for EBPP services, the biller generates an electronic version of the consumer's billing information. The biller may outsource this responsibility using a bill service provider (BSP). These BSPs act as agents on behalf of the biller and provide such services as electronic bill translation, formatting, data parsing, and, at times, hosting the biller's website. Next, the biller notifies the consumer of a pending bill, generally via e-mail, and the consumer is directed to log onto each biller's website (or to a BSP's website), where the biller presents the consumer with an electronic version of the billing statement (see figure 3). After viewing the online bill, the consumer can initiate payment directly from the website. From the time of enrollment to the time of initiating payment, there are no other parties that come between the biller (or its BSP) and consumer. Thus, the biller (or its BSP) is responsible for interfacing with the customer to enroll, access electronic billing information, and make payments.

Biller-direct advantages

For the most part, the biller-direct model exceeds the biller's basic expectations. It provides the biller with an electronic method of creating and notifying the consumer of pending bills in a cost-efficient manner. It is estimated that the electronic creation of all consumer bills would significantly reduce bill statement production costs.

The model also provides a more reliable, faster delivery mechanism for both bill delivery and payment receipt, compared with traditional bill presentment and payment (Kerr and Litan, 2000). Delays and interruptions can have negative effects on the biller's cash flow. The model also has the potential to reduce costs through the use of electronic consumer dispute resolution mechanisms. It is estimated that 70 percent of calls to telephone-based customer service centers concern billing statements (IBM, 2000). Online resolution could reduce the labor and overhead costs associated with customer service centers.

The biller-direct model is also advantageous for the biller in that it maintains direct contact with the consumer. Since the biller controls how the bill is visually presented through its website, it can maintain its brand identity. The biller-direct model can also lead to better cross-sell and up-sell opportunities. It attempts to integrate bill presentment with specialized, targeted marketing techniques, rather than broad-based advertising that may not apply to all consumers. Since

FIGURE 2

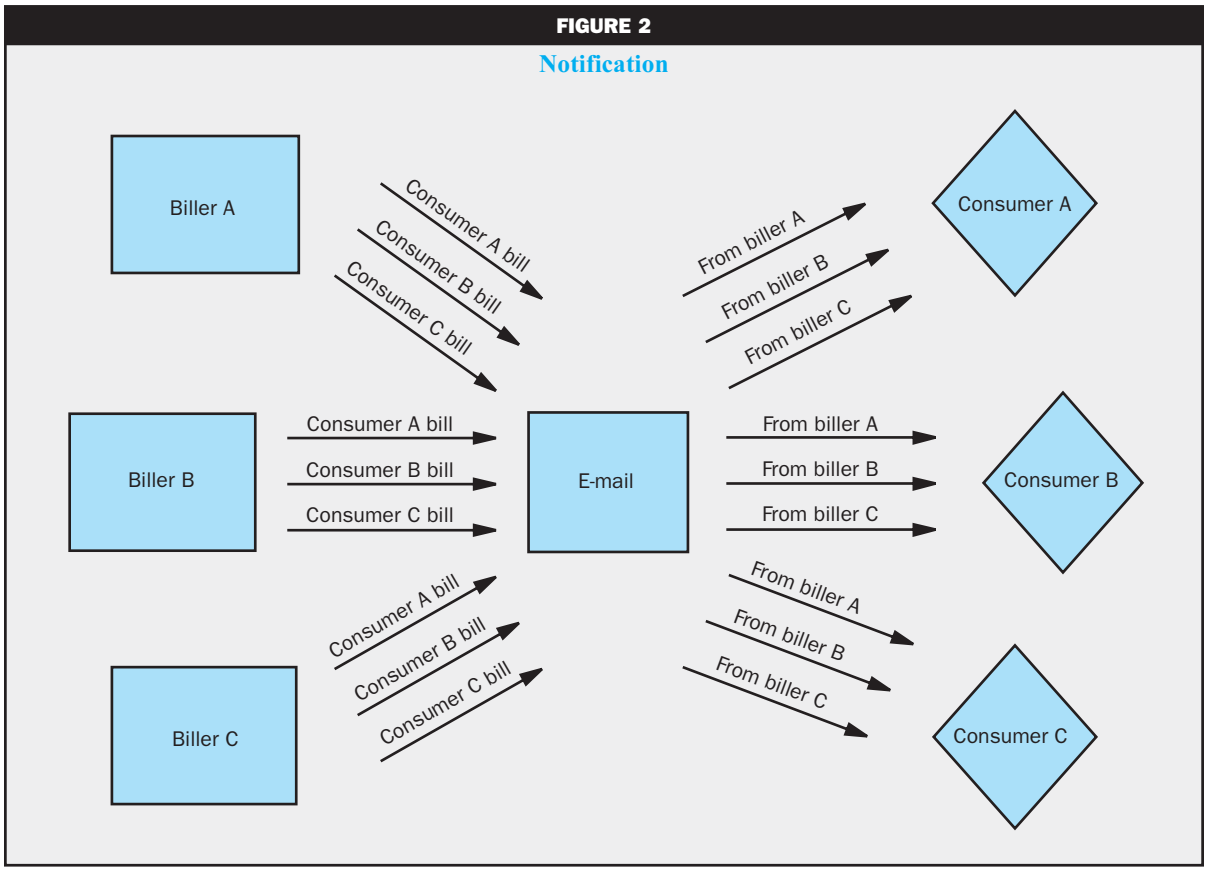
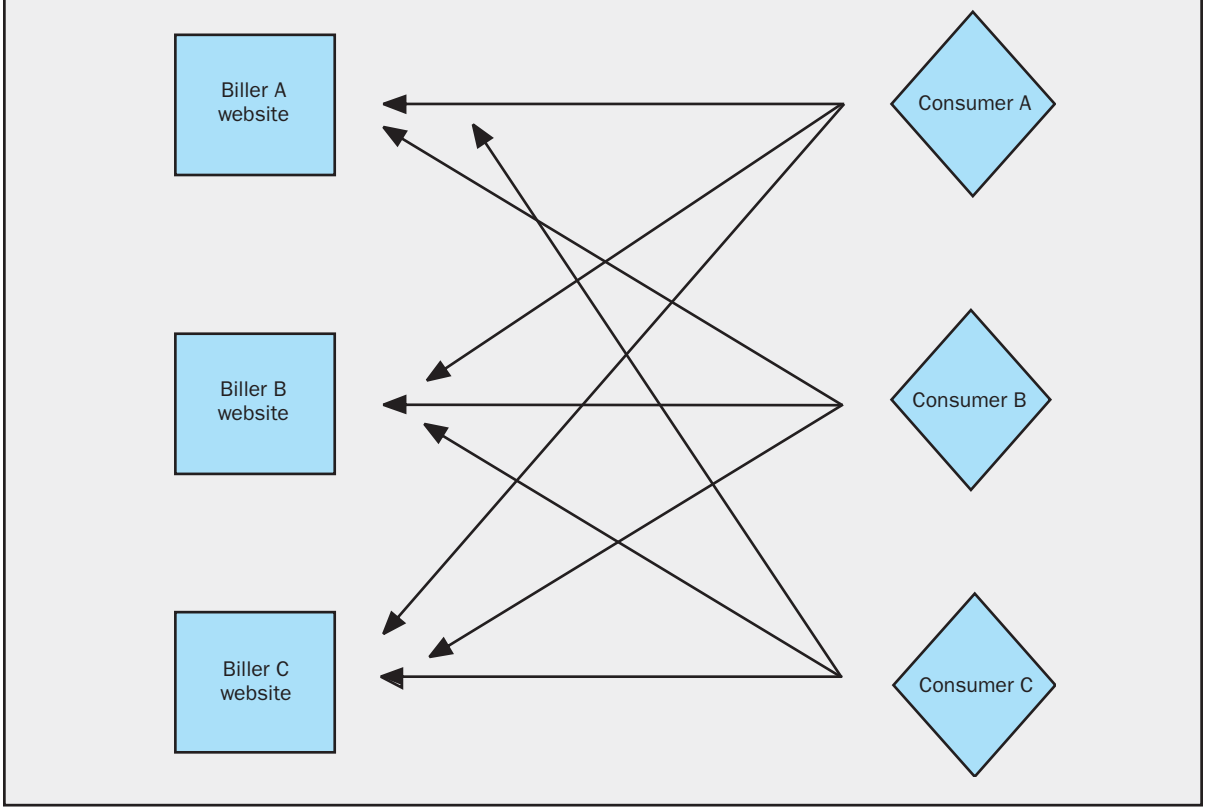


FIGURE 3

Biller-direct presentment



the biller controls the consumer's demographic data (captured during the enrollment process) and purchasing habit data (through billing data), it can more easily target different market segments.

Finally, since the biller relies on its own (or its BSP's) processing systems, it does not risk third-party integration problems seen in other EBPP models (Doculabs, 1999). In its survey of consumer high-volume billers (over 250,000 bills a month), Gartner Group estimated that by year-end 2000, 74 percent of e-billers would be presenting on their own company's website (Kerr and Litan, 2000).

From the consumer's perspective, the biller-direct model meets many of the basic expectations seen in the traditional mailing system model. Customers expect EBPP costs that are just as low (or even lower) than their current bill paying costs. Under the biller-direct model, the customer saves on mailing and check writing costs when submitting payments. In addition, biller-direct applications are usually offered free of charge.

The majority of consumers perceive the U.S. Postal Service to be a secure, private, and reliable way of transporting bills and payment (Whaling, 2000a). EBPP offerings utilizing the biller-direct model use login IDs, passwords, and encryption technology to provide sufficient protection for privacy of consumers' bill records, as well as the actual payments. Biller-direct providers are relying not only on the 128-bit RC4 encryption in the consumer's browser, but also on additional encryption and secure channels for all messages sent between the biller, financial institution, and consumer. In addition, consumers may be more comfortable establishing EBPP arrangements directly with billers with whom they have existing relationships—rather than with unknown third parties. Using the Internet as a reliable delivery mechanism also results in a reduction of potential late fees due to lost mail or misplaced payments.[7]

Finally, consumers benefit from the biller-direct model from a customer service perspective. Consumers have the ability to access current or real-time information since billers are able to update customer data more frequently. The biller-direct model also allows for simpler and faster dispute resolution online versus current telephone contacts. Market research indicates that direct billers have a tendency to provide better customer service than third parties (Robinson, 2000).

Biller-direct disadvantages

The biggest disadvantage of the biller-direct approach is that consumers must take the initiative to visit multiple billers' websites to view and pay their bills. Even if some billers use the same BSP, it is currently unlikely that all of a consumer's billing information can be received from a single site. This can be time-consuming and potentially confusing if all billers do not use similar processes or interfaces for presenting bills and accepting payments, in addition to the multiple usernames and passwords the consumer must remember. While this model was acceptable to the early adopters, it may be too cumbersome for the broader consumer market.

Another disadvantage for consumers utilizing the biller-direct model is that not all billers provide a wide range of electronic payment options for each consumer's payment needs. In the traditional model, all consumers have access to one universal payment option, the check.[8]

For billers, the largest disadvantage to implementing the biller-direct model is that it is expensive to establish, design, host, and maintain an in-house application (Doculabs, 1999). In a survey of high-volume billers building or buying software for in-house EBPP, first year expenditures in EBPP programs averaged nearly $570,000 (Kerr and Litan, 2000).

Consolidation/aggregation model

The consolidation model was introduced to address consumers' desire to have one destination to access and pay their bills while reducing the cost to billers of implementing EBPP. In this model, the biller sends the customer's billing information to a third party called a bill consolidator. The consolidator, operating on behalf of the biller (or the aggregator operating on behalf of the consumer) combines data from multiple billers and consolidates the information at a single destination. Although some consolidators present bills at their own websites, most support the aggregation of bills by consumer service providers (CSPs) such as Internet portals, financial institutions, and brokerage websites (see figure 4).

Thick consolidation

Two variations of the consolidation model have emerged, *thick* and *thin* consolidation. Under thick consolidation, the consolidator maintains both the summary and details of the customer's billing information. The customer does not need to have one-on-one contact with the original biller to view the full detail of bills due.

Thick consolidation advantages

In the thick consolidation model, the biller can offer EBPP services to its customers without having to implement its own costly infrastructure. Smaller billers lacking financial resources can still enter the EBPP arena quickly. In fact, Gartner Group found that 41 percent of current consolidation users cited the ability to start e-billing quickly as the top reason for using the thick consolidation model (Kerr and Litan, 2000).

For consumers, having a third party offer EBPP services may be to their advantage if the third party is able to offer numerous electronic payment options not supported directly by the biller. Depending on the consolidation site chosen, convenience may be increased by allowing consumers to access their billing data at popular Internet sites where they can perform other tasks (such as online banking or online shopping).

Financial institutions could potentially garner several benefits if they choose to host a bill consolidation site. In contrast to the traditional and biller-direct models, with this model banks are no longer forced into the background performing simple payment processing. Banks' entry into hosting an EBPP consolidation site could help drive the use of other online banking services, thus maintaining customer relationships (McPherson, 2001).

Thick consolidation disadvantages

Under the thick consolidation model, billers generally lose branding, marketing, and cross-selling capabilities as consolidators eliminate direct contact between billers and customers. In addition, billers risk losing control over consumer data once it moves to the consolidator.

For consumers, unlike providers offering the biller-direct EBPP model, providers of the third-party consolidation/aggregation model typically charge a fee of approximately $4–$12 per month. This is problematic given that 59 percent of consumers are not willing to pay for online bill payment and only 6 percent are willing to pay more than $5 (Kerr and Litan, 2000). In addition, customer service levels may be reduced as consumers are directed to different contacts for different problems.

Thin consolidation

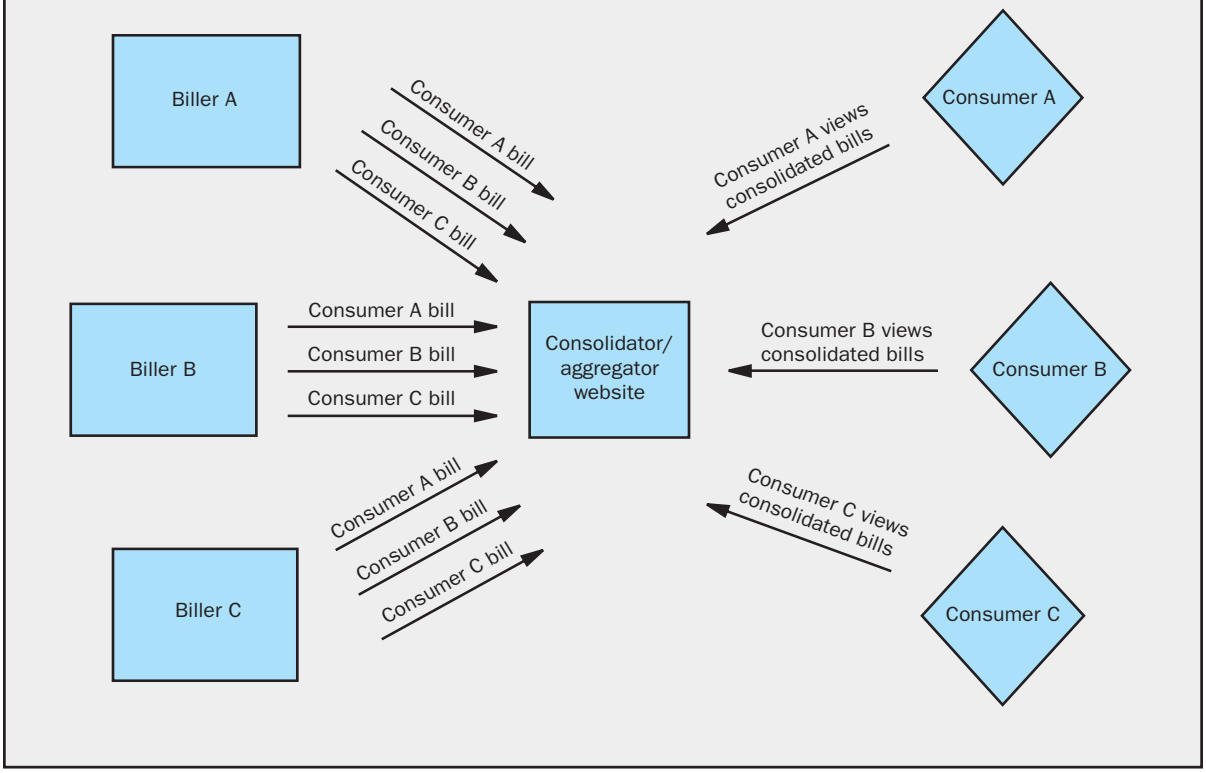
Under the thin consolidation model, the biller maintains the details of the customer's billing information while a summary is forwarded to the consolidator. Customers can view a summary of their bills on the consolidator's site, while those desiring to view the details are linked to the original biller's website.

Thin consolidation advantages

The thin consolidation model allows billers a greater opportunity to provide online customer service, cross market products, and gain greater control of their e-billing process, particularly by maintaining control over consumer data (Kerr, 2000). Furthermore,

FIGURE 4

Consolidation/aggregation



similar to the biller-direct model, the thin consolidation model provides consumers with the perceived security and comfort of knowing that their billing information is stored by the biller, an entity with which they already have an established relationship.

Thin consolidation disadvantages

While this model may be advantageous for marketing purposes, billers still lose the marketing channel if customers choose not to view the full details of their bills. In addition, the biller must bear the cost of hosting a website where consumers can view the details of their bills. Finally, issues with technology, standards, and security increase between the consolidator's and the biller's website, as they must be more closely integrated than in the thick consolidation model. Because the consolidation models involve the transmission of more data and the number of parties involved increases, the potential for errors also increases if the industry lacks a universal message standard for data exchange. Several groups are currently working on a universal open standard that would allow billers to present bills to any customer, anywhere, at anytime.

Two industry standards have been introduced over the last few years, the Open Financial Exchange (OFX) and Interactive Financial Exchange (IFX). Both of these standards are in their infancy. While OFX has the widest acceptance, it is a very basic standard that supports HyperText Markup Language (HTML) and lacks the depth to support any level of complexity in a billing statement for consumers.[9] Meanwhile, IFX is being aggressively pursued by industry workgroups and EBPP software providers. Since IFX is Extensible Markup Language (XML) based, it is more robust than OFX, with mechanisms for richer payment information and customer transaction tracking functionality (West, 2001). However, given that the industry has yet to adopt one standard for data exchange, integration issues in the consolidation/aggregation models persist.

Consolidation preferences

Larger billers are beginning to show a preference for the thin consolidation model. In its survey of high-volume billers, Gartner Group found that in 1999, 59 percent of billers that adopted the consolidation model used the thick model. In contrast, nearly 63 percent of billers planning to implement EBPP services in the future intended to use the thin consolidation model by year-end 2000. In fact, 64 percent of billers currently utilizing the thick model intended to switch to the thin consolidation model within the next three years.

It was also estimated that 75 percent of high-volume billers will use the thin consolidation model by year-end 2002 (Kerr and Litan, 2000).

According to Gartner Group, the consolidation model's high fees, lengthy and confusing enrollment, and fragmented customer service have kept enrollment low (Litan, 2000). The challenge inherent in both variations of the consolidation model is the coordination between the different parties involved in the process. Once these issues are resolved, growth of the consolidation model is expected to increase. As the number and type of sites that aggregate multiple bills continue to grow, use of the consolidation model is expected to outpace that of the biller-direct model by 2004. Financial institutions, brokerages, Web portals, and now the U.S. Postal Service have all added EBPP to their online offerings (Kerr, 2000).

Although industry experts suspect that consumers will ultimately prefer to have all of their bills presented at one location, the disadvantages of the consolidation models (namely, security, customer service, high fees, and cumbersome enrollment procedures) may perpetuate the use of the biller-direct model. Given the advantages and disadvantages of each model, it is not surprising that many billers currently use both the direct model and variations of the consolidation models. In its 2000 survey of high-volume billers, Gartner Group indicated that by year-end 2000, 74 percent of e-billers would be presenting on their own company's website, while 73 percent would have contracted with third-party bill consolidators (Kerr and Litan, 2000).

Alternative consolidation/aggregation models

Other variations of the consolidation/aggregation model exist. These mainly consist of differences in bill delivery or creation methods. Next, we provide a brief summary of the alternative aggregation EBPP models.

Total bill consolidation

This is the only model that currently enables customers to view all their bills at a single point via the Internet. Total bill consolidation providers require customers to redirect their bills to the provider's data center, which serves as a lockbox operation where bills are scanned and transformed into electronic format (usually in a portable document format or PDF). After bills are converted to electronic format, they are presented at a consumer service provider (CSP) (Jeffrey, 2000).

The primary advantage of the total bill consolidation model is that there is no need for standard systems and there are no complicated issues regarding thick versus thin hosting. In addition, scan and pay companies can provide customers with all of their bills electronically, regardless of whether the biller provides its bills electronically.

One of the limitations of this model is the reliance of the bill scanner on printing and mailing checks to the biller after the customer has authorized payment. In fact, it is estimated that over 50 percent of bills presented electronically via the total bill consolidation method are settled with the biller via check (Glossman et al., 2000). In addition, consumers do not receive bills any faster (in some cases more slowly) and the value of the bill is improved little over the paper version, since it has no interactive capabilities. For billers, direct contact with the customer is lost. In fact, the biller may not even be aware that the customer has redirected statements to a total bill consolidator.

Screen scraping

Screen scrapers are companies that capture customer data from multiple billers' websites with the use of customer supplied IDs and passwords. Once captured, the data is presented at the screen scraper's aggregation website or other CSP aggregation website. Screen scraping companies provide the software used for screen-scraping purposes.

In the past, screen scraping was primarily a unilateral procedure initiated by the screen scraper acting on behalf of the consumer. A major disadvantage of this model to billers was that they were not involved in the process. Billers were unaware that their customers' information had been screen scraped. This raised concerns about security, privacy, and data accuracy, as well as liability and regulatory issues. With resistance to screen scraping fading within the past year, there has been a more collaborative approach between billers and screen scrapers. Major consolidators and major financial institutions have embraced screen-scraping technology. Although this approach fulfills a customer's desire for aggregation, it has yet to be seen if screen scraping will adequately address the issues of liability, security, privacy, and data accuracy (Gillespie, 2000).

One attempt to decrease the use of screen scraping in data aggregation is being headed by the Financial Services Technology Consortium (FSTC). Its goal is to test methods of account aggregation, whereby financial institutions and aggregators work together to facilitate accurate display of customer data without screen-scraping or without the customer's surrender of financial institution access codes to third-party aggregators (Gram, 2001).

Consumer consolidation model

In the consumer consolidation model, electronic bills are delivered directly to the customer's desktop.

The biller maintains control of bill details until delivery to the customer is complete. The customer is then able to control and store bills and can integrate them into offline programs, such as personal financial management software. When payments are initiated via a personal financial management software program, the payments are facilitated through a consolidator. As a result, payments may be made via check, ACH, credit, or debit card payments.

The major advantage of the consumer consolidation model is that the consumer is able to work offline. One of its less attractive features is that consumers are required to download or purchase special software to view bills rather than using a standard browser (Chandler, 1998).

E-mail consolidation

In the e-mail-based billing model, companies enable the full detailed billing statement to be sent directly from the biller to the consumer in HTML format. To the consumer, the billing data received resembles a Web page and can contain graphics, advertisements, links to the biller's website, links for immediate bill payment, and a link to customer service (Kille, 2001).

The major advantage of the e-mail-based model is that consumers are comfortable using e-mail. It also allows for personalized electronic exchanges from biller to consumer (Rini, 2000). As in the biller-direct model, the biller maintains complete control over the bill delivery process. For the consumer, there is no need to download or learn any special software or device.

Disadvantages of this mode of bill delivery are that the billing information is not interactive and there is no guarantee that the consumer's e-mail post office will properly deliver the e-mail.

EBPP payment options

The payment mechanisms used by consumers in the EBPP process are essentially the same as those used in a traditional bill payment environment: check, ACH, credit card, and debit card. Consumers often authorize payments online rather than in paper form. These payments are sometimes fulfilled in an electronic fashion; however, many EBPP providers still issue payments via check on behalf of the consumer. Currently, bill payment service providers process an estimated 40 percent of bill payments via check, with less than 60 percent of the remaining bill payments processed electronically, predominantly through the ACH (Whaling, 2000b). Regardless of how the payments are ultimately made, payment instructions are most often provided online in EBPP applications—introducing concerns about the privacy of consumers' information, the security of payment data being transmitted, and the authentication of parties to the transaction.

Privacy of information is one of the most critical issues in an online environment. This is made more difficult by the fact that EBPP providers may be subject to different rules and requirements protecting consumers' information, depending on whether the provider is a financial or nonfinancial institution. To make matters more complex, state privacy laws vary greatly in terms of the protection provided to consumers.[10]

The security of the billing information presented and the payment instructions received are also of concern in an online environment. For an EBPP solution to be effective, it must protect the integrity of billing data presented and payment instructions received through the entire process. Hackers, disgruntled employees, fraudulent billers, or insufficient data security procedures can threaten the security of the process. Also, since EBPP is relatively new, there is little (if any) legal precedent identifying the responsible parties in the event that billing or payment data are compromised.

Due to the electronic nature of EBPP transactions, authentication of the parties involved is essential. In a traditional environment, consumers receiving bills via the mail generally assume that these bills are legitimate if they follow the biller's conventional format. On the payment side, the legal framework is well established to provide parties to a transaction with protection from fraud—largely based on paper-based signatures. When bills are presented online, the consumer has little way of knowing whether the biller really issued those bills, unless the consumer uses the biller-direct model or has some kind of guarantee of authenticity from the service provider.

Conversely, the identity of the consumer must be authenticated to ensure that payment instructions being provided are not being initiated fraudulently. In an online environment, it is unclear what constitutes "authentication"—particularly from a regulatory standpoint. Progress is being made in this area, with the approval of the Uniform Electronic Transactions Act (UETA) and its adoption in more than 20 states. The federal Electronic Signatures in Global and National Commerce Act (the "E-Sign Act"), part of which became effective in October 2000, considers and promotes electronic signatures as an appropriate means of authenticating identity. Per a March 29, 2001, press release, the Federal Reserve Board of Governors is currently modifying Federal Reserve Regulation E, which applies to electronic payments, to reflect certain provisions of the E-Sign Act.

Each of the four primary payment mechanisms used for bill payment has advantages and disadvantages in conjunction with electronic bill presentment. To some extent, consumer choice will drive the popularity of the payment mechanisms. In many electronic transactions, though, the way in which the payment is made is unknown to the consumer. Ultimately, this means that billers' and financial institutions' preferences for one financial instrument over another could have a significant impact on the mechanism that ultimately dominates EBPP.

Check

The payment component of EBPP is sometimes accomplished via paper check if a biller participating in an electronic transaction cannot receive electronic payments. In these cases, the consumer often provides electronic payment instructions to the service provider, but the service provider executes the payment by writing a check to the biller. Consumers are often unaware that a check payment has been made to the biller because their portion of the transaction is entirely electronic.

Checks provide important benefits in the EBPP process in that they can be used to pay virtually anyone—even billers that are unable to receive electronic payments. However, there is a unique disadvantage for some billers receiving checks in an EBPP environment. Service providers sometimes consolidate (by biller) multiple consumer payments initiated electronically in a check-and-list format. A biller receiving a check-and-list payment receives a single check payment with a list of the consumers' payments included in the lump sum. The biller then must use a manual process to reconcile the payments received in its billing system, which can be labor-intensive and introduces yet another opportunity for error into the reconciliation of bills. Electronic payment options streamline this process, and would seem to be preferable from a biller's perspective for use in conjunction with EBPP.

From the perspective of payment system efficiency, though, the check-and-list process does reduce the total number of checks that would have to be processed if each consumer paid those bills by check. In addition, the check and list removes authentication issues between the biller and the EBPP service provider; the service provider essentially assumes responsibility for authenticating the identity of consumers initiating payments.

ACH

ACH is the most common electronic payment option used for consumer bill payments. In a traditional environment, ACH transactions are sometimes perceived negatively by consumers citing a need for greater control over the timing and amount of their bill payments. However, EBPP applications can often provide consumers with greater control over their ACH payments. Consumers have the option to pay bills through one-time ACH credit transactions initiated through their financial institutions, through one-time ACH debit payments authorized online (that is, click to pay), or through the more traditional automated recurring debit transactions (direct debit) authorized online or via paper.

Though online bill payment applications appear to remove some of the barriers to consumer use of ACH payments, there are still some obstacles that must be overcome. Many billers (particularly small- and medium-sized organizations) do not initiate or receive electronic payments. The reasons for this are uncertain and require further investigation as discussed in the "Barriers to EBPP" section of this article. In addition, the consumer enrollment and authentication process for ACH payments is not standardized—partly due to the fact that the regulatory environment surrounding ACH debit is still evolving to accommodate online initiation of payments. This poses challenges for those educating consumers about electronic payments and for EBPP providers wanting to offer ACH as a payment option. Lastly, the consumer protections associated with unauthorized ACH transactions are not as robust or well known as they are for other payment options, which may be preventing greater usage.

Credit card

Credit card payments are another electronic payment option sometimes available to consumers participating in EBPP arrangements. From a biller's perspective, credit card transactions are generally more costly than other electronic payment alternatives and are not accepted by all billers, which may limit their use in the electronic payments arena. It is important to note, though, that some credit cards now feature embedded micro chips that store information useful in authenticating the identity of the consumer. If these cards can increase the reliability of authentication of the consumers, billers may be more receptive to them due to the reduced risk that a bill payment transaction will be fraudulent (although it is unclear whether fraud related to consumer bill payment is a significant issue for billers).

Credit card usage is prevalent among consumers in an online environment. Since EBPP applications are typically available via the Internet, consumers may pressure more billers to accept credit card payments.[11] Some billers that allow consumers to pay their

bills via credit card are now charging a special fee for their use. It is not clear whether billers are charging this fee to cover the increased cost of the transaction, to discourage widespread use of credit cards for bill payment, or due to other reasons. If this becomes a common, accepted practice, more billers may be encouraged to accept credit cards for bill payments.

Debit card

Debit card transactions are also sometimes used for the payment of electronically presented bills. Offline debit cards are most commonly used because these transactions can be processed offline through the credit card networks. Online debit transactions have not been used on a widespread basis, which may be because there is no standard industry model for authenticating consumers' identities and for connecting with the ATM networks to obtain the instant verification of funds availability that is needed to process online debits.

Online debit card transactions are currently being piloted on the Internet. One such pilot, launched in February 2001 by BillMatrix Corporation in conjunction with Star Systems, Inc., allows consumers to pay their utility bills using a debit card. In addition, NACHA, the Electronic Payments Association, sponsored a pilot which concluded in March 2001 of consumer debit card use on the Internet; the NACHA pilot combined use of the debit card with a digital signature for authentication purposes. The success of both of these pilots remains to be seen, but interested parties are working to ensure that the debit card plays a role in Internet-based payment transactions.

Barriers to EBPP

In the introduction to this article, we asked the question: What barriers are preventing widespread adoption of electronic presentment and payment? Initial research has uncovered a number of barriers:

1. Lack of incentives for participants,
2. Lack of standards for enrollment and data exchange,
3. Concerns over security and privacy of financial information, and
4. Legal issues surrounding industry regulations, liability, dispute resolution, and consumer protections.

Lack of incentives for consumers

EBPP services need to save consumers money and time compared with traditional bill payment. Consumers appear reluctant to use EBPP until more of their bills are available electronically. Checks are perceived to be free and relatively easy to use. Industry analysts agree that consumer adoption would grow more rapidly if EBPP services were offered for free or at a fee lower than current costs associated with check payments. Gartner Group reported that a majority of consumers, 59 percent, say they do not want to pay anything for account and bill payment aggregation services, and 51 percent feel other payment types, including checks, cash, and debit cards, are easier to use (Kerr and Litan, 2000).

A cumbersome set-up process and long lead time for electronic payments may also need to be addressed to entice further usage. Consumers often have to wait one billing cycle to set up credit card, debit card, or ACH payments for their bills. Some consumers may also experience a three- to five-day delay between the time their account is debited and the merchant is paid.

Consumers may not change existing bill payment habits until they perceive a strong value proposition with EBPP. One approach may be to price paper presentment and payment more directly so as to encourage consumers to utilize electronic alternatives. An alternative potential solution may be to attract consumers to adopt electronic payments through financial incentives.

Incentives for financial institutions

EBPP could result in lost revenue for financial institutions operating retail lockboxes (the service of financial institutions processing remittance information from a post office box and depositing them directly into an account) and check-processing operations. Some institutions struggle with the inherent conflict of reducing check revenue when promoting electronic payment usage. Furthermore, current pricing policies for electronic and check payments may discourage the use of electronic payment alternatives.

However, pressure from EBPP providers has resulted in financial institutions entering the marketplace either directly with more user friendly and less costly EBPP options or by partnering with consolidators. In addition, service providers are targeting financial institutions by offering network switches that utilize open architecture for settlement of EBPP transactions.

Incentives for billers

The initial costs associated with implementation of e-billing programs for high-volume billers are estimated to average $570,000 (Kerr and Litan, 2000). High implementation costs and the need to operate multiple, complex, billing systems concurrently have likely discouraged biller adoption. The lack of standards and the uncertainty surrounding future EBPP solutions introduce additional disincentives for billers considering participation.

While 32 percent of all large volume billers (greater than 250,000 bills a month) (Kerr and Litan,

2000) are presenting electronically, adoption rates drop considerably for small to medium-sized billers for both electronic presentment and payment. However, adoption by the largest billers may generate the critical mass required to convince consumers of the benefits of EBPP because, as noted earlier, the largest billers generate 80 percent of bills.

However, the adoption of EBPP has not necessarily led to end-to-end electronic payments. Virtually all consumer bills are paid electronically when they are presented electronically and the consumer has initiated payment online (click and pay). A majority of these payments are completed via the ACH.[12] However, consumer-initiated online recurring bill payments that are not presented electronically (primarily the pay-anyone model) are often completed via check. Additional research is needed to investigate if online-initiated check payments are driven by the billers' inability to accept electronic payments or if other barriers are also contributing to the use of paper payments in EBPP.

Incentives for third-party service providers

The dominance of several providers, lack of open systems, and lack of universally accepted standards may serve as deterrents to new entrants. While larger providers may have the financial resources to develop solutions for multiple standards, the lack of standards may limit smaller providers' capabilities. It is also unclear if third-party pricing policies for electronic and check payments discourage the use of electronic methods.

Lack of standards for enrollment

The multitude of models, payment options, and providers require consumers to use various cumbersome, inconsistent enrollment methods to establish EBPP services. The method of enrollment may vary depending on the biller and/or the model. The fragmented enrollment process has historically been a major barrier for the traditional ACH direct payment product. In the direct payment enrollment process, the onus is typically on the consumer to contact each biller to enroll, change, or cancel automatic deductions. This same type of problem is apparent in the initial EBPP enrollment process, where the burden is again on the consumer to search for billers offering EBPP services. The pay-anyone model tries to alleviate this burden by allowing consumers to initiate payments online to anyone regardless of how the bill is received. While this model begins to address some of the barriers to EBPP, it also appears to introduce paper payments into the process.

Standards for data exchange

The lack of universal message standards for data exchange continues to hamper growth in EBPP. Several standards have been introduced over the last few years, including OFX and IFX. Industry adoption has been slow, and participants continue to use different formats for the exchange of presentment data, hindering interoperability between various provider and biller systems.

Security and privacy concerns

Consumers are concerned about the security and privacy of the financial information required for the EBPP process. Gartner Group surveyed consumers and determined that of Internet users who do not pay bills online, 52 percent are concerned about privacy and 48 percent are concerned about security and fraud (Barto, 2001).

Some security and privacy concerns regarding electronic data transfer for bill presentment include data confidentiality and integrity, billing statement issuer authentication, and nonrepudiation of statements (Whaling, 2000a). Specifically, the issues include the protection of the data that is transferred between biller, service provider, and consumer from being read or modified; verification that the billing statement received by the consumer was sent from the biller or service provider; and proof of the exact contents of the billing statements.

Legal issues

When the EBPP provider is a financial organization, this raises a number of legal and regulatory considerations that might not be relevant to a typical commercial provider. The question of which state's or country's laws control an Internet relationship is still developing (Spiotto and Mantel, 2000). States have adopted different consumer protection laws, which may be applicable to EBPP services.

Consumers may be exposed to differing protection rights and liabilities. The dispute resolution process may vary depending on the players, models, and payment options. The current legal and regulatory environment is still primarily designed for a paper environment.

Conclusion

In recent years, commercial use of the Internet has changed the way consumers and billers interact. Traditionally, consumers received paper billing statements for products or services rendered; most consumers then forwarded a check to the biller via mail to pay the amount due. As an information delivery channel, the Internet has provided a new alternative

for billers and consumers to complete these transactions. Today, some billers are leveraging the Internet to facilitate EBPP, in which billing statements are delivered to consumers and consumers provide bill payment instructions via e-mail or on the Internet.

In this article, we addressed two important questions: What barriers are preventing widespread adoption of EBPP?, and Will the electronic delivery of bills increase the use of electronic payments? Industry analysts have heralded EBPP as the "killer application" enabled by the Internet, and some have claimed that electronic presentment of bills will be the key driver leading to the electronic payment of bills. However, we find that in spite of extremely optimistic predictions of growth for EBPP, actual use of EBPP is estimated at less than 1 percent of consumers' electronically paid bills (Kerr and Litan, 2000). Furthermore, upon closer look at the industry, we find that checks are still predominately used to pay consumer bills—including bills that are presented electronically.

We have uncovered several barriers to greater use of EBPP and electronic payments. The most critical barrier is that key parties have insufficient incentives to use EBPP and/or electronic payments instead of traditional presentment and payment methods. Another inhibiting factor is the lack of standards in several areas of the industry: The enrollment process is inconsistent among service providers, and there are no universally accepted standards for the presentment of bills, thus hindering greater interoperability in the industry. As with other Internet-based applications, security and privacy concerns may be slowing the adoption of EBPP, as are uncertainties and obstacles in the legal and regulatory environment.

It is unclear whether increased EBPP usage will truly drive the use of electronic payments among consumers—and if so, what their electronic payment method of choice will be. This article identifies the key barriers to EBPP and suggests some areas in which incentives could be provided to encourage greater use of EBPP and electronic payments. Some, but not all, of these areas represent potential opportunities for both the private and public sector in facilitating the migration from traditional paper-based payments to electronic payments.

NOTES

[1]Admittedly, this cost estimate overstates the real resource cost of bill payment, because some of the cost represents transfers among various participants and third-party providers.

[2]These operations may be done internally by the biller or outsourced to third parties.

[3]This assumes 15 billion bills at $.70 and 17 billion bills at $1.50. The wide range in cost may reflect differences in unit cost for large and small billers and differences in the way the cost estimates were made.

[4]The consumer may have access to overdraft facilities that would allow them to make payment without having funds in their transactions account.

[5]For further information regarding the advantages and disadvantages of each payment mechanism, see Chakravorti, 1997; Chakravorti and Shah, 2001; Federal Reserve Board, 1996; Federal Reserve System, 1997; Flatraaker and Robinson, 1995; Humphrey and Berger, 1990; Humphrey, Kim, and Vale, 1998; and Wells, 1996.

[6]Cost comparison is done at the margin and does not include transition costs.

[7]Industry participants hope that the Internet will prove reliable; however, there are some reliability concerns relating to e-mail delivery and website hosting.

[8]A consumer does not necessarily need a single electronic payment option, but rather various payment options with flexibility to meet their needs and wishes.

[9]As of mid-2000, OFX had achieved broader industry support with the release of OFX 2.0, an XML compliant version.

[10]It can be argued that a provider of bills to customers in several states must satisfy the privacy expectations in each state, and the various requirements might conflict.

[11]This is in part because all four of the major credit card networks limit consumer liability for unauthorized use to zero if proper processing rules are followed.

[12]Consumers may also choose to only view electronically presented bills and write checks rather than initiate online payments. These types of transactions are not currently tracked and are therefore not included in this discussion.

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