

Board of Governors of the Federal Reserve System

Staff Study

175

The Future of Retail Electronic Payments Systems:
Industry Interviews and Analysis

Federal Reserve Staff
for the Payments System Development Committee
Federal Reserve System

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Foreword

During the past decade, consumers, businesses, and governments have continued to increase their use of electronic payments. At the same time, advances in computer processing, telecommunications, and data storage have contributed to a range of payments system innovations. Although only a limited number of these innovations have enjoyed commercial success so far, there has been some movement toward expanding the range of options and techniques for making electronic payments in the United States and increasing the overall efficiency of the payments system.

To understand the implications of these developments and to gather more information about barriers to payments innovation, the Federal Reserve's Payments System Development Committee asked Federal Reserve staff to conduct discussions with a broad range of parties interested in the evolution of the payments system.¹ Special attention was given to issues involving the clearing and settlement of retail electronic payments. Part 1 of the following report provides an informative overview of the diverse opinions expressed in the discussions. Part 2 summarizes and provides further information, where possible, on specific comments and recommendations made by those interviewed. These comments and recommendations are directed at both the public and private sectors.

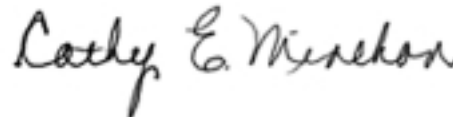
The committee has decided to make this report public as part of its ongoing efforts to inform and educate the public regarding the important issues affecting retail payments in the United States. The report itself should be viewed as a general resource for the public and not as an endorsement of any specific viewpoint or recommendation. The report shows that no single issue was consistently identified nor any single recommendation made by a significant number of organizations interviewed.

Instead, the recommendations tended to track the specific business needs or viewpoints of those interviewed. In addition, no systemic problems or barriers to innovation were identified in existing clearing and settlement arrangements. Rather, these arrangements tended to be treated as an institutional framework within which to innovate, not a framework that needed to be changed.

Nevertheless, the report does not support or imply complacency. Rather, it points to the complexity and difficulty of innovation. This situation reinforces the need to identify and address barriers to innovation when this is in the public interest. It also reinforces the need to pay careful attention to clearing and settlement arrangements, which are the foundation of the payments system. These arrangements must evolve so that they support not only safe and efficient payments today, but also safe and efficient payments in the future.



Roger W. Ferguson, Jr.
Vice Chairman
Board of Governors of the
Federal Reserve System



Cathy E. Minehan
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1. A primary focus of the Payments System Development Committee is to assess whether regulatory or operational barriers to innovation may inhibit the long-term development of the payments system. Accordingly, the committee has engaged in a number of activities, including outreach to the private sector, that are aimed at identifying and addressing barriers to innovation.

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The Future of Retail Electronic Payments Systems: Industry Interviews and Analysis

1. Summary of Industry Interviews and Findings

Market, technological, and legal developments have contributed to a surge of innovation and change in payments systems in recent years, including the development of new means of making payments and the alteration of existing means. Traditional payments service providers such as banks and bank associations have been involved in a large number of challenging projects.¹ A significant amount of creativity has also come from new entrants into various parts of the payments system, including data- and transaction-processing firms, technology firms, and retailers. The number of project proposals was particularly high during the technology boom of the 1990s. A few of these have become relatively successful, but others have failed. Nevertheless, the use of electronic instruments for making retail payments has become much more common in the United States in the past ten years. On-line commerce and banking also continue to grow, although perhaps more slowly than initial predictions. Over the longer term, however, the continued development of safe and efficient electronic commerce and finance will likely also require the continued development of safe and efficient retail electronic payments systems.

During the past ten years, the credit card industry moved early to facilitate on-line payments in retail electronic commerce, and credit cards continue to be the dominant payment instrument in this field.² Major debit cards that clear through the credit card networks can also be used for on-line transactions, thereby providing cardholders with one means of making payments using traditional deposit-account

balances at banks. Several innovators have attempted to create completely new payment instruments for use in electronic commerce, although most typically provide a new interface for end users to the payments system while relying on existing electronic systems, such as the automated clearinghouse (ACH), for clearing and settlement.³

The most striking development in the U.S. payments system has been the overall growth in electronic payments using credit and debit cards and the ACH. The number of noncash retail payments made with these instruments grew fivefold from 1979 to 2000, with debit cards growing dramatically toward the end of the period.⁴ The proportion of retail noncash payments made electronically grew from 15 percent in 1979 to 40 percent in 2000. Indeed, although checks are still the dominant noncash retail payment instrument by volume and value, recent evidence suggests that the aggregate number of checks written may have peaked in the mid-1990s. Businesses, in particular, continue to use checks heavily as a means of payment (almost 14 billion business payments in 2000), but they are slowly migrating toward the greater use of electronic payment instruments, including the ACH and wire transfer systems.

Although the use of electronic payments systems has grown significantly, the basic design of core clearing and settlement systems for electronic retail payments has not changed considerably.

1. The term "bank" is used in this context to mean any depository institution, including commercial banks, thrifts, and credit unions.

2. The term "payment instrument" is used in this report as a generic term to cover checks, debit cards, credit cards, automated clearinghouse (ACH) instructions, and other devices for making payments. This usage is consistent with terminology in the Federal Reserve System's Committee on the Federal Reserve in the Payments Mechanism (the Rivlin Committee) report and Bank for International Settlements reports. This usage, however, is not consistent in all cases with U.S. legal definitions of a "payment instrument."

3. Clearing is the process of transmitting and reconciling payment or transfer instructions and in some instances confirming payment orders or the security of the instructions prior to settlement. Settlement is the discharge of obligations with respect to the transfer of funds or securities between two or more parties. (Source: "A Glossary of Terms Used in Payments and Settlement Systems," Committee on Payment and Settlement Systems, Bank for International Settlements, January 2001.) Electronic clearing and settlement systems include the ACH, retail electronic funds transfer systems (for example, ATM and debit card systems), credit card systems, and wire transfer systems.

4. Most of the data cited in this paragraph is from "A Snapshot of the U.S. Payments Landscape," Federal Reserve System, Retail Payments Research Project, 2002 (available at www.frbservices.org/Industry/frIndustry.cfm), and from Geoffrey R. Gerdes and Jack K. Walton II, "The Use of Checks and Other Noncash Payment Instruments in the United States," *Federal Reserve Bulletin*, vol. 88 (August 2002), pp. 360-374 (available at www.federalreserve.gov/pubs/bulletin/2002/0802_2nd.pdf).

Looking forward, innovation may become increasingly desirable, to strengthen both the safety and the efficiency of various elements of electronic payments systems. As in the past, innovators will likely face numerous business challenges, including slowly changing payments practices by users of payments systems. Innovation, however, should not be hindered by significant barriers to improvement or by a lack of flexibility in markets. From the standpoint of public policy, it is important to identify barriers to innovation and, when appropriate, to search for ways to address them.

The Interviews

In light of recent innovations and anticipated developments in the payments system, the Federal Reserve's Payments System Development Committee (PSDC) asked Federal Reserve staff to seek the views of private-sector organizations and other interested parties, including government agencies, about longer-term payments system developments in general, and the key issues that will shape future clearing and settlement systems in particular.⁵

5. The Federal Reserve Board established the PSDC in 1999 to work with the private sector to identify barriers to innovation in the payments system, identify strategies for enhancing the long-term efficiency of existing U.S. payments systems, and develop strategies for moving to the next generation of electronic payments. PSDC members are Board Vice Chairman Roger W. Ferguson, Jr., and Federal Reserve Bank of Boston President Cathy E. Minehan (co-chairs), Federal Reserve Bank of Chicago President Michael H. Moskow, Federal Reserve Bank of New York First Vice President Jamie B. Stewart, and Federal Reserve Bank of Atlanta First Vice President Patrick K. Barron. Federal Reserve staff who contributed to the project are listed in appendix A.

Staff separately interviewed representatives of forty-nine organizations, mainly from the end of 2001 through the first half of 2002.⁶ These organizations included, among others, corporate end users of payments services, technology firms, banks, private-sector payments system operators, and nonbank suppliers of payments services (see table 1). In the interviews, staff sought views on several key questions, including

- What are providers of financial services and information technology doing that will change and improve the nation's payments systems?
- What are corporate users of payments services doing that will change and improve the ways in which they make and receive payments?
- What barriers to innovation have been encountered?
- What issues should be brought to the attention of the Federal Reserve or other appropriate organizations?

The general findings from the interviews are summarized in the remainder of this section. Details and recommendations from the interviewees are presented in part 2.

Key Issues

More than one hundred individuals participated in the interviews. They discussed numerous projects and raised a range of issues. Overall, the discussions yielded a picture of a payments system in flux, with

6. Appendix B provides information on the interview process and assesses the potential limitations of the process.

1. Organizations Interviewed, by Type

Type of organization	Number interviewed	Description
Corporate end users	6	Large industrial firms; physical and virtual retailers
Technology firms	8	Firms (such as software vendors and system integrators) that work with corporate end users and banks to build and manage their internal information technology
Financial services providers	6	Nonbank firms that offer payments services, such as electronic money, to consumer and corporate end users
Other service providers	2	Firms that provide security services supporting the financial industry
Payments processors	4	Firms that provide transaction and clearing services on behalf of corporate end users and banks
Banks	8	Small, mid-size, and large depository institutions
Infrastructure providers	8	Credit card associations, electronic funds transfer networks, and other operators of clearing services
Others	7	Payments system rule-making associations, government agencies, law and consulting firms, and other parties interested in the payments system, domestically and abroad
Total interviewed	49	

many organizations pursuing one or more efforts simultaneously. Interviewees expressed different visions of the future and varying perceptions of barriers to innovation. Some of the differences can be attributed to the large number and different types of organizations involved in the payments system; other differences are a result of interviewees having different organizational priorities and constraints. Taken together, these differences make gaining wide cooperation among service providers and, potentially, end users on significant undertakings, such as infrastructure changes, extremely challenging. For this and other reasons, incremental changes rather than broad visions frequently dominated the interview discussions. Not surprisingly, even discussions of incremental changes often revealed considerably different approaches to solving associated problems.

Although the interviewees raised numerous issues and proposed differing approaches, most of their key points can be grouped into a few broad categories. Overall, their responses provide insight into the current state of retail payments systems and suggest actions that the Federal Reserve, the financial industry, or others could take to foster efficiency and safety.

- Many interviewees stated that having a “business case” for adopting an innovation in electronic payments systems and, particularly, identifying the demand for innovation are much more important than simply having access to the new technology that would permit the innovation. Providers of payments services cannot assume that an innovative service will generate significant demand just because the service provides new technical capabilities in a creative way. Providing a net benefit to the key participants in a transaction, such as banks, service providers, and end users, appears frequently to be the most important aspect of successful innovation.
- Interviewees expressed a desire for further development of low-cost instruments for initiating rapid interbank transfers to and from deposit accounts using the Internet.⁷ Currently, few instruments allow end users to make real-time, on-line purchases using funds from a demand deposit account. The inability to verify easily and reliably the identity of individuals attempting to make (or receive) payments over the Internet poses a significant problem for the advancement of such transfers. Proposals for solving the problem were varied.
- Several organizations expressed a desire to improve check collection, although they saw improved collection as only a temporary measure until electronically initiated payments are even more widely adopted than at present. The events of September 11, 2001, in particular, led organizations to place greater emphasis on the transformation of checks into electronic payment instructions and on moving toward greater use of electronic payment instruments overall.
- Interviewees expressed differing views on how quickly a payment transaction should settle—real time, near-real time, or next day. Many interviewees preferred real-time settlement but concluded that in light of cost considerations, less-costly alternatives that could achieve similar results, such as payment guarantees with next-day settlement, might be acceptable.
- Some interviewees believed that the exchange of information with business partners about an underlying payments transaction is more important to a business than the potential savings from making or receiving payments electronically. They perceived considerable value in receiving an electronic payment and associated information formatted in such a way that the payment and information can be processed straight through to their internal systems. Incomplete technology integration, however, limits banks’, corporations’, and consumers’ ability to send, receive, and use electronically transmitted business information at low cost.
- Several interviewees believed that the lack of agreed-upon standards for payment messages, such as message formats and the way in which payments information is included, and the consequent lack of systems interoperability are the greatest problems for the financial industry. The lack of interoperability affects transactions among businesses and, in some cases, between businesses and their banks. The interviewees’ suggestions for achieving agreement on standards varied considerably, with no single suggestion receiving broad endorsement.
- Cross-border electronic payments, which can be quite costly and cumbersome, concerned several interviewees. In particular, the lack of compatible standards for sending electronic payments across payments systems in different countries contributes to the cost and difficulty.
- Many organizations view laws and regulations related to payments as complex, confusing, and adding some uncertainty to their operations. Interviewees appeared, however, to take regulations as a given, something to be worked with

7. Interbank funds transfers involve the exchange of payment instructions and funds between banks.

or around but not necessarily changed. Few interviewees made specific suggestions for improving the legal and regulatory environment to foster greater innovation.

- Several interviewees stated that the Federal Reserve should continue to adopt innovation or extend its services so as to foster innovation in the private sector.

Future Direction

The Payments System Development Committee intends to explore several issues raised in the interviews and examine the recommendations that relate to the Federal Reserve Board and the Reserve Banks. The following subsections present areas where the PSDC believes the Federal Reserve and other organizations may contribute to reducing barriers or fostering innovation in the payments system. At the same time, the PSDC encourages participants in all aspects of the payments system to explore and address, where appropriate, the issues raised in the interviews. Participants at all levels—large organizations that have historically been active in the payments arena as well as small, less traditional organizations—have roles in facilitating change.

Innovations

To foster innovation, the Federal Reserve will continue to consider requests from the private sector to support payments innovation through its operations or by other means, as appropriate. Currently, the Federal Reserve Banks are providing limited operational support to one private-sector project, the Universal Payment Identification Code project of the Clearing House (formerly the New York Clearing House). The Federal Reserve will also continue to consider requests for changes to portions of its regulations that are seen as presenting potential barriers to innovation. In addition, the Board has sent to Congress proposed legislation intended to address a perceived barrier to greater use of electronic check presentment.⁸

8. The draft act submitted by the Federal Reserve Board, referred to as the Check Truncation Act, is available at www.federalreserve.gov/paymentsystems/truncation/default.htm. See also The Check Clearing for the 21st Century Act (H.R. 5414, 107th Congress (2002)) and The Check Truncation Act (S. 3034, 107th Congress (2002)), which are available at <http://thomas.loc.gov/>.

On-line Interbank Payments

The Internet has transformed the way consumers and businesses think about and conduct commerce, yet surprisingly few options exist for making electronic commerce payments, especially compared with the number of options for making payments associated with more traditional commerce.⁹ Specifically, consumers and businesses have only limited options for making payments using their demand deposit accounts, which is somewhat surprising considering that other than currency, demand deposits represent the predominant medium of exchange. There may be several explanations for this phenomenon. Demand may be insufficient for alternative on-line payment instruments. Security issues may have held back development. With notable exceptions, the existing clearing and settlement infrastructure may not be conducive to an on-line environment. It may also be that the complexity of this issue and the large number of players that it may involve do not lead to simple and widely acceptable solutions. The PSDC believes that the development of additional, secure on-line payment instruments that use demand deposit accounts is potentially important for fostering electronic commerce in the long term, and it will continue to monitor the progress of initiatives in this area.

Timing of Settlement

As the time between the clearing and settlement of a payment lengthens, the risks to the payments participants generally increase. In the past, banks and nonbank firms considered this risk a cost of participating in the payments system, but they have become less accepting of this risk as the costs of technology have decreased and their sophistication in risk management has increased. So although firms may disagree about whether real-time or near-real-time clearing and settlement is preferable, the broader message is clearly that they should be faster and final.

Interviewees suggested faster clearing and settlement not only for payment instructions but also for return instructions, that is, for instructions that receiving banks return to sending or originating banks, for example, because of insufficient funds to settle an instruction or a closed account. Returns are an important part of the payments process, and there

9. Commerce includes consumer-to-business, business-to-consumer, consumer-to-consumer, and business-to-business payments. For the purposes of this report, business payments cover payments by or to governments, businesses, and other organizations.

is room for improvement in return times, particularly for ACH debit transactions. Improvements in returns could reduce risk and help participants more effectively manage it. For example, originators of ACH debit transfer instructions could manage their risks more effectively if they did not have to wait three or four days to receive notification that such an instruction has been returned.

As an initial step, the Federal Reserve Banks are working with industry representatives on a pilot project involving a same-day ACH product that would involve settlement by close of business for transactions received that day by a specified cutoff time. Same-day ACH would not only speed the clearing and settlement of forward-originated ACH payments but would also shorten the time frame in which the originating bank would receive returns. This effort, although significant, is only one step. The Reserve Banks and others, including infrastructure providers and banks, may need to take additional actions to achieve faster clearing and settlement of both forward-originated and returned instructions.

Standards

The payments system is evolving as businesses and consumers seek the convenience and efficiency of electronic payment instruments. The development and adoption of standards are key to achieving widespread use of electronic payments as well as other goals such as payments system safety and accessibility. A common standard can enable the straight-through processing of electronic payments files from the originator of the transfer to the receiver. Open standards, such as eXtensible Markup Language, or XML, can further promote interoperability by enabling systems based on different standards to communicate more readily. The lack of a common standard for a payments system and its participants at various levels can increase the cost of participating in the system and introduce inefficiencies such as format translation and manual processing.

In light of the current environment, the PSDC recently undertook a review of Federal Reserve activities related to standards development and the Reserve Banks have instituted several changes to make their activities related to standards more proactive and collaborative with industry initiatives. The Reserve Banks have increased their participation in several bodies concerned with standards, such as the Internet Engineering Task Force and the Organization for the Advancement of Structured Informa-

tion Standards. The Reserve Banks have also discussed with SWIFT, a company specializing in the transmission of messages for payments and other financial transactions, its continuing efforts to develop and revise file-transfer and other standards for cross-border payments. The Reserve Banks plan to continue to work with SWIFT and other organizations on cross-border initiatives. The Reserve Banks are also considering the adoption of SWIFT standards for their Fedwire funds transfer service and will be conducting further analysis and seeking further industry views on this proposal moving forward. Finally, the Reserve Banks have created an industry group (the Interoperability in the Check Processing and Truncation Environments Workgroup) to establish workable action plans, including implementation strategies and timelines, for reducing obstacles to the collection and settlement of checks without the movement of paper. At the same time, the Reserve Banks are continuing to work on initiatives with respect to electronic check presentment (ECP) and related standards activities.

Cross-border Payments

The speed, cost, and reliability of payments that must cross national borders are a concern for consumers and businesses that have international relationships. Some believe that the Federal Reserve should play a more proactive role in addressing these concerns. The Federal Reserve Banks are currently offering cross-border ACH services into Canada and are pursuing ACH initiatives for cross-border payments involving Mexico, Europe, and other areas. In addition, the Federal Reserve is working at the international level with other central banks to better understand retail payments systems. For instance, in September 2002, the Committee on Payment and Settlement Systems, which meets at the Bank for International Settlements, published a preliminary paper on policy issues for retail payments, "Policy Issues for Central Banks in Retail Payments."¹⁰ The paper requests information on consumer and business cross-border payments to help inform the committee and its member central banks. While these efforts are a beginning, the PSDC believes that there may be a need for further enhancements in the

10. The Committee on Payment and Settlement Systems consists of the central banks of the Group of Ten countries, Hong Kong SAR, and Singapore plus the European Central Bank. The committee serves as a forum for the central banks to monitor and analyze developments in wholesale and retail payments and clearing and settlement systems. Further information is available at www.bis.org/index.htm; the preliminary paper is at www.bis.org/publ/cps50.htm.

payments system to improve the variety of cross-border payments services offered to end users. In this respect, private-sector organizations will need to play a key role in fostering faster, safer, and lower cost cross-border payments.

Opportunities and Challenges

Over time, existing clearing and settlement systems will be redesigned in fundamental ways to accommodate new technologies and new business processes. Some interviewees envision advanced systems that give end users options in such areas as timing, finality, information capability, and fees. Such systems might incorporate tools for managing the risk of originating and receiving payments, including tools for authenticating and authorizing end users in real time. Other interviewees look to a future in which end users have direct and easy access to clearing and settlement systems—a change that would increase end users' control and options and lower their costs but also would likely add risk to those systems and alter traditional banking practices. Still other interviewees foresee more-limited, but nevertheless challenging, possibilities. For example, some picture a universal payment message that enables interoperability among existing payments systems, thereby increasing processing flexibility and efficiency. Such a message format might also accommodate more-efficient, more-reliable means for transferring and integrating payments and payment-related information.

Regardless of the way the future unfolds, it is clear that payments systems will change over time. Existing systems will be redesigned, or perhaps replaced altogether, and established business relationships may be altered. The ways in which these changes will be worked out in the marketplace cannot be readily predicted. Nonetheless, the opportunities are intriguing. For instance, if a uniform and efficient means of transferring and integrating payments and payment-related information, such as purchasing agreements and invoices, were to become widely available, businesses could see a major change in the way account payables and receivables are reconciled. Further, the continuing proliferation of computers and spread of access to the Internet could make it possible for payments providers to offer consumers faster and cheaper services.

At the same time the redesign or replacement of existing payments systems opens opportunities, there

will also be a need to develop safeguards to ensure a balance between safety and efficiency. Market developments and business practices, including those in the credit card industry, are responding to consumer and business needs related to authentication and authorization techniques for on-line retail payments. On the other hand, authentication and authorization techniques have not evolved as far as many would like, potentially limiting the use of some types of payments, particularly on-line payments. It seems likely that as merchants, financial institutions, and other service providers gain experience, payments systems will be able to employ robust, but cost-effective, authentication and authorization techniques.

The redesign or replacement of existing payments systems may also require participants and their customers to make changes to their own systems and processes. Making such changes may not come easily or cheaply. Currently, incomplete integration of technology widely affects the ability of banks, corporations, and consumers to develop and use new payments and information services. This incompatibility problem has hindered developments in the past and is likely to do so in the future. Indeed, during the interview period, firms' priorities were moving in another direction: Spending on technology was declining, and corporate technology priorities were shifting to address the business and security issues resulting from the terrorist attacks on September 11, 2001. This environment may help explain why interviewees tended to focus on making incremental changes to payments systems and building on the existing infrastructure rather than on creating new systems.

The existing clearing and settlement infrastructure was generally developed to support check payments and the early generation of electronic payments. It may no longer fully suit the needs of participants in the current, rapidly evolving market with its more-distributed computer and communications infrastructure. Although they do not share a single vision of a future payments system, payments service providers and their customers will need to work together in the future—to replace aging technologies and to continue the search for safe and efficient means of conducting business. In this environment, existing and potential service providers, including those providing clearing and settlement services, will need to find ways to lay a strong foundation for both strategic and incremental enhancements of payments systems to support the evolving needs of commerce.

2. Industry Observations and Recommendations

The interviews with industry representatives highlighted key issues that will affect the future development of the payments system. The issues can be grouped into nine distinct, though overlapping, topics:

- Innovations in the market environment
- On-line payments from deposit accounts
- Transition of check payments from paper to electronic
- Real-time transaction processing, clearing, and settlement
- Information related to electronic payments
- Standards
- Cross-border payments
- Laws, regulations, and private-sector rules
- Federal Reserve services and miscellaneous topics.

Innovations in the Market Environment

Net Benefits

Many of those interviewed, including those working with a second or third generation of innovations, stated that having a “business case” for adopting an innovation is much more important than the technology that would permit its adoption.¹¹ For a new payments method to be adopted broadly, it generally must have positive net benefits (or, at the very least, no net costs) for each critical party involved (of which there are many).

The recent history of payments innovation illustrates the link between net benefits and the broad acceptance of new instruments and services. For instance, according to one software provider, three key factors influenced the ultimate acceptance of electronic credit card terminals at merchant locations during the 1980s: The terminals required little up-front investment or reengineering of business processes by merchants, added value to merchants’ businesses by reducing fraudulent transactions, and reduced the transaction time for consumers because retailers no longer needed to review a “hot list” of

bad cards or place phone calls to get an authorization code. Conversely, payment instruments or services that require significant changes to internal business processes or computer systems, with modest improvement in payments practices, may be too costly or complex to succeed. Also, instruments or services requiring modifications to several systems overseen by several departments in a single organization can fall victim to conflicting priorities and incentives within that organization. Further, a requirement for significant or costly actions by large numbers of consumers, such as upgrading personal computers or downloading software, can be costly and inconvenient and imply very low rates of adoption.

Familiarity

Innovations that require little change from known and established practices may be more readily accepted than those that are substantially new and unfamiliar. To bring new payments services to end users, firms, especially emerging players, are using new technology to leverage existing payments systems. By doing so, the firms both take advantage of established practices that are familiar to users and reduce their start-up costs. With little change in payments habits, consumers engaged in electronic commerce have generally been able to conduct transactions using credit cards or signature-based debit cards and receive much faster service than they would have had they paid by check. Where these credit and debit card arrangements would have required significant changes in rules and business practices, firms promoting new types of person-to-person electronic payments to support on-line commerce have been able to attract users. For example, Internet auction purchases between individuals or between individuals and small businesses have been supported by new forms of person-to-person payments, which so far have proved more effective than checks or credit cards in supporting such commerce. Interestingly, these types of payments have relied on the credit card and ACH relationships for funding on-line payments and accounts as well as withdrawing funds from these accounts.

Competition for Resources

New, perhaps innovative, payments technologies frequently compete with checks and more-established

11. “Business case” is a catch-all term for the assessment of the likely overall profitability of a proposed investment. Factors contributing to profitability include, but are not limited to, the cost of developing and implementing a technological change, the time to develop and implement change, the increased revenues or decreased costs from the change, and the distribution of net benefits among participants.

electronic payments methods for financial resources and management attention within a firm or industry. For example, a number of firms reported conflicts within banks over how to support existing payments services and at the same time provide for the development and deployment of new, unproven technologies and emerging services. Long-term projects or changes that threaten current business lines, especially profitable credit and debit card operations, may not receive organizational support because of departmental conflicts and short planning horizons.¹² Emerging players believe that the result of such competing influences has been the protection of established electronic payment instruments (that is, debit and credit card products) at the expense of innovation and evolution of the payments market.

Critical Mass and Network Effects

Some payments innovators believe that because the U.S. banking system is more fragmented than those of other countries (for example, Canada and Belgium), the U.S. market presents more challenges in convincing a critical mass of banks and their customers to adopt new products and services. If a payments innovation requires change—in systems, services, practices, or habits—by a substantial number of end users, banks, software vendors, or intermediaries, then individuals or firms may be reluctant to adopt until others go first. This reluctance may delay adoption of an otherwise useful or cost-effective innovation. For this reason, some innovators may choose to introduce new products in smaller, more concentrated markets—perhaps outside the United States or in a “closed” environment such as a college or corporate campus—where the hurdles to coordinating actions among different participants in a payments system are lower.

12. Banks earn revenue from credit and signature-based debit cards through transaction fees. Transaction fees, which are calculated as a percentage of the value of a transaction, are collected from the merchant. Each party in the process—the merchant’s bank, the cardholder’s bank, and the card association—receives a portion of the total fees paid by the merchant. In addition, a cardholder’s bank earns interest on outstanding balances and also charges service fees to cardholders. Overall, for cardholders’ banks, revenue from credit card transactions appears to be the second highest source of revenue from payments services, after deposit accounts (Lawrence J. Radecki, “Banks’ Payments-Driven Revenues,” Federal Reserve Bank of New York, 1999). Signature-based debit cards also appear to be a fairly lucrative source of earnings from transaction fees.

*Interviewee Recommendations and Discussion*¹³

- *The Federal Reserve should encourage innovation in electronic payments and support innovative private-sector payments projects through its operations or other means. (Recommended by eight organizations)*

The Federal Reserve strongly believes that private-sector innovation can improve payments system efficiency. It supports increased use of electronic payments and a reduction of paper in the payments system. In their operations, the Federal Reserve Banks, for instance, are working to develop value-added Fedwire and ACH services that will be useful to consumers and businesses and increase their use of electronic payments. The Federal Reserve will also continue to consider whether and how much to support private-sector payments innovations. Several firms have identified projects in various stages of development that they would like the Federal Reserve to support. The Clearing House, for example, asked for operational and settlement support of its Universal Payment Identification Code (UPIC) initiative.¹⁴ Subsequently, the Reserve Banks made minor changes to their ACH operating system and agreed to support the project, which began in May 2002.

- *The financial industry should work with vendors of bank software and other service providers to facilitate greater use of electronic payments. (two organizations)*

Over the past decade, banks have increasingly used off-the-shelf software developed by vendors rather than creating their own payments-processing software. Vendors of bank software and other service providers now play a significant role in changing and improving the efficiency of the payments system. The cooperation of these organizations in making

13. All of the interviewee recommendations in this report are listed together in appendix C.

14. The Clearing House established the UPIC concept for its ACH and wholesale payments systems. UPIC is intended to promote electronic credit payments between business partners. It allows a business to give its partners an electronic address to which electronic payments may be sent (using a credit transfer) without disclosing information that could be used to initiate an unauthorized debit transaction. UPIC substitutes for bank account and routing number information in the transactions. The Clearing House assigns UPIC numbers permanently, which allows a business to change its banking relationships without notifying its partners. Further information is available at www.upic.com. Related to this project, the Clearing House conducted research, including interviews, to better understand the barriers to businesses’ greater use of electronic payments and electronic data. In August 2002, the Clearing House published a report on its findings titled “The Remaining Barriers to ePayments and Straight-through Processing.” (See www.epaynetwork.com/files/CH_Study_Final.pdf.)

changes to established payments systems has become increasingly important. Closer cooperation with software vendors, for example, was among the improvements the National Automated Clearing House Association (NACHA), which develops and maintains the operating rules for the ACH payments system, recommended in its paper “The Future Vision of the ACH Network.”¹⁵ The Federal Reserve Banks are also working with the major provider of ACH software, used by banks and others, to ensure that the software is compatible with changes to the Reserve Banks’ ACH service. These efforts toward a more collaborative approach by payments system organizations and vendors should help streamline and facilitate future changes in the payments system.

- *The Federal Reserve Banks should set a dollar limit on checks that they process. Payees would need to arrange for alternative, electronic payments for amounts above the limit. (two organizations)*

To encourage the electronic processing of large payments, the Federal Reserve Banks no longer handle commercial checks in amounts \$100 million or more. In July 2001, the Reserve Banks also began to charge institutions \$50 for any check for \$10 million or more deposited with them.

On-line Payments from Deposit Accounts

Interviewees expressed a desire for further development of low-cost payment instruments that would permit consumers and businesses to make real-time interbank funds transfers for the purpose of conducting electronic commerce. Funds in deposit accounts are widely used for making payments in the United States, yet few instruments exist that allow account holders to access their deposit accounts for the purpose of conducting electronic commerce. The option most widely available today is the signature-based debit card (for example, the Visa Check Card and Debit MasterCard Card), which allows a cardholder to draw on a deposit account to pay a merchant that accepts cards issued by the sponsoring card association.¹⁶ Credit cards, however, are

currently the dominant payment instrument for consumer and some low-value forms of business transactions in electronic commerce.

Dissatisfaction with the Status Quo, and Potential Alternatives

Merchants and a variety of others that were interviewed stated that they would like to reduce their payments-related costs by developing alternatives to credit cards for electronic commerce. Merchants expressed a belief that the fees for credit card payments are higher than for alternative instruments and not sufficiently sensitive to risk.¹⁷ Moreover, as the value of an electronic commerce transaction increases, for example to several thousand dollars, credit card fees can become a significant deterrent to conducting on-line transactions. To avoid such costs, retailers, the U.S. Treasury, and others have developed some ACH-based solutions. For example, Treasury’s Pay.gov Internet portal permits secure payments over the ACH using certain security-enhancing and fraud-prevention technologies. Notwithstanding the cost concerns of those interviewed, credit cards do provide important risk-management services to merchants and consumers in conducting on-line transactions, along with reliable processing systems and widely shared rules.¹⁸

cent of all ACH transactions in 2001), and end users and processors expressed concern that the difficulties associated with authenticating and authorizing users are likely to hinder widespread adoption. Other options include home banking and bill-payment systems that allow users to make remittance payments or one-time funds transfers; these products are not particularly well suited to conducting on-line commerce, however.

17. On-line merchants, in particular, stated that the credit card fee structure does not distinguish adequately between different types of card-not-present transactions, which have different levels of chargeback risk. These merchants claimed that even effectively managing the credit and fraud risks of on-line transactions does not reduce their credit card fees. Merchants also suggested that the first transaction with a particular customer is risky because of authentication and authorization risks but that subsequent transactions typically become more predictable and less risky.

18. The card associations and others pointed out that the associations provide important services for their fees, particularly risk management and consumer protection for fraudulent transactions; some claimed that the latter service facilitated Internet shopping. Specifically, Visa and MasterCard provide “zero-liability” protection for consumer transactions made using their respective credit and debit cards when the transaction flows through their individual networks. The protection applies to cards issued in the United States for on-line and traditional transactions. Each program has provisions for transaction eligibility; for example, the protection may apply only if the account is in good standing. Some interviewees also believe that the similarity of credit cards (and signature-based debit cards) to traditional processes and the simplicity of using them for on-line transactions greatly affects their relative use on the Internet.

15. NACHA published “The Future Vision of the ACH Network” in April 2002. The paper sets forth twelve recommendations related to risk management, quality, and value-added services for the ACH network. The executive summary is available at www.nacha.org.

16. First-generation experiments with a PIN-based debit card in which the card is not present have not yet proved commercially successful, though the debit card networks continue to seek ways to use their existing infrastructure and relationships to offer products that debit deposit accounts. ACH payments over the Internet are still relatively new (accounting for fewer than 1 per-

In response to a perceived market opportunity for more payments options on the Internet (more in line with the payment mix available for traditional commerce), several developers are trying to devise new services. Currently, several infrastructure providers and others are developing credit-push instruments using the ACH and retail electronic funds transfer (EFT) networks. A credit-push transfer would enable an account holder to “push” a payment from his or her deposit account—in contrast to a debit transaction, in which a receiver of a payment requests a transfer of funds from a deposit account. In theory, the push approach increases the account holder’s control over the account—thus increasing comfort with the transaction—and reduces the likelihood that the account holder will claim that a transaction was not authorized. With this model in mind, NACHA had been developing a credit-push instrument, called ACH Credit Transactions Initiated Online, or ACTION, that would authenticate buyers over the Internet, guarantee payment to the merchant, and clear and settle the payment using the ACH network. In November 2002, NACHA decided to place the proof of concept for ACTION on hold until better market conditions exist for launching the initiative. Several organizations expressed enthusiasm for on-line retail payments using the ACH network because of its low cost and the potential to provide services to consumers who have deposit accounts but do not have credit cards or signature-based debit cards. However, credit-push instruments rely on the willingness of banks to originate ACH payments, and not all banks originate ACH transactions or want to take on the security, fraud, and financial risks of doing so.

Security, Fraud, and Privacy Risks

Several interviewees, including infrastructure providers and processors, noted some concern about security, fraud, and privacy risks associated with making deposit accounts widely available to individuals and businesses for electronic commerce. Technology firms and others have been working on various approaches to address these concerns. Today, however, easily deployable, cost-effective methods for authenticating and authorizing retail payments transactions in real time to manage security and fraud risks on line are limited.¹⁹ Some firms—mostly infrastructure and software

providers—are experimenting with authenticating an on-line “session.” A session would comprise all activities, from browsing to making a payment transaction, from the moment the user’s identity is verified until the communication is broken. Some major card associations are using techniques that authenticate only the individual payment transaction and not the entire session (for example, Verified-by-Visa and Secure Payment Application by MasterCard). Other techniques for authorization and authentication are less technology intensive. For example, some end users and processors search commercial databases to authenticate users or provide for authorization of ACH payments; the searches are expensive, however, and are not foolproof. For the future, some infrastructure providers proposed preserving the underlying ACH infrastructure but adding on a system for authentication or authorization, or both. One approach would use familiar PIN-based debit card authorization capabilities, which are real-time, in conjunction with an ACH transfer.²⁰

Interviewee Recommendations and Discussion

- *The financial industry should facilitate the on-line transfer of funds from deposit accounts. (six organizations)*

Three of the six firms making this recommendation recommended developing on-line credit-push instruments. While some organizations are working on such instruments, others are experimenting with on-line debit payments. In the past several years, both NYCE and STAR (the latter working with NACHA) have completed pilot programs involving debit payments over the Internet using public key technology. As with on-line credit-push initiatives, on-line debit payments using the ATM networks are still at a relatively early stage of development, and their commercial viability has yet to be demonstrated.

- *The Federal Reserve should support the creation of authentication techniques and should require the authentication of consumers in on-line transactions. (one organization)*

The Federal Reserve recognizes the importance of authenticating on-line transactions and encourages the private sector to develop authentication tech-

19. Authentication involves verifying the origin of a message (such as a deposit account) or the identity of the originator. Authorization involves granting authority to send a payment instruction.

20. NACHA noted in its paper “The Future Vision of the ACH Network” that it “. . . does not believe that the ACH network should evolve into a real-time, on-line network similar to the wire funds transfer payment systems.”

niques for on-line retail payments. Currently, the private sector is experimenting with several possible ways to address the lack of adequate authentication techniques. It will be up to the market—financial institutions, processors, vendors, and end users—to determine whether to adopt these authentication techniques or to otherwise manage their risks. The Federal Reserve believes that customer authentication techniques are most efficiently and effectively determined by the private-sector participants that use those techniques.

- *The Federal Reserve should support the creation of an authority that certifies that a payments product or service is safe and protects the privacy of end users. (one organization)*

The Federal Reserve does not anticipate that it would become, or be a participant in, a certification authority for the safety and privacy of payments products or services. Such a role would raise several issues, including moral hazard. The Banking Industry Technology Secretariat (BITS) offers a product certification program that certifies technology products related to financial services on the basis of a minimum standard of security (more information is available at www.bitsinfo.org/fslab.html). In addition, other firms, such as Verisign, certify the security of web sites on the basis of a stated set of criteria.

- *The Federal Reserve should help promote digital certificates and perhaps serve as a root authority that would issue and certify digital certificates. (one organization)*

The general market for digital certificates is still evolving, and future developments cannot be fully anticipated. However, several private-sector service providers, such as Identrus and Verisign, currently provide a range of services related to digital certificates. The Federal Reserve does not currently foresee for itself a role as a general root authority for digital certificates issued by the financial industry.²¹ The Federal Reserve Banks do, however, serve as the root authority for issuing digital certificates that authenticate their own customers' access to the Reserve Banks' web-based services; serving as the root authority for such certificates is critical to safeguarding their security.

21. A root authority is the owner of the digital certificate system. The root authority sets the rules for the digital certificate system, names the entities (referred to as certificate authorities) that will issue and approve certificates in that system, and warrants the certificate authorities' qualifications.

Transition of Check Payments from Paper to Electronic

On the assumption that checks will continue to play a significant role in the U.S. payments system for some time, several banks, a third-party processor, a payments association, and a retailer discussed their efforts to deploy new electronic tools for the collection of check payments. These organizations are motivated by a desire to reduce the cost of check collection, but they also see the deployment of these new electronic tools as a transition step until there is greater acceptance of payments that are initiated electronically. Interviewees noted, for instance, that truncating checks earlier in the payments or collection process than has been the case historically could combine the benefits of checks to users with the processing efficiencies of electronic payments systems. Processing efficiencies reduce the handling of paper and may enable faster clearing and return of some checks.²²

In a process that has become increasingly popular over the past few years, merchants and billers may scan paper checks at the point of sale and at lockbox locations, respectively, using special reading equipment to convert the paper payments to electronic payments that can be cleared through the electronic funds transfer systems, such as the debit card and ACH networks. At the point of sale, the merchant returns the paper check to the user immediately, while at lockbox locations, the mailed check is destroyed after a short period of time and only an electronic copy is retained. One retailer estimates that for point-of-sale transactions, eliminating the handling of paper could reduce its check-processing costs 80 percent.²³

Processors and banks also expressed interest in imaging and truncating checks as early as possible in the check-clearing process to reduce costs and improve collection times. One processor, for instance, wanted the Federal Reserve Banks to capture images of checks at the Reserve Bank at which the check is first deposited and reengineer their systems to present images rather than physical checks directly to banks in that or any other Reserve Bank District.

22. The Federal Reserve Board continues to monitor developments in the check collection and return process and will consider changes to funds availability schedules, defined in Regulation CC, if such developments improve return times significantly. (See 64 FR 37708, July 13, 1999, for a discussion of the factors the Board would consider in shortening the funds availability schedules in Regulation CC.)

23. This retailer, as well as others, is also experimenting with the electronic capture of signatures for credit cards and signature-based debit cards. The electronic capture of signatures eliminates the need to retain the customer receipt in paper form and thus reduces handling costs.

One bank advocated intervening one step earlier in the process by truncating, imaging, and storing checks at the commercial bank of first deposit.

To help address barriers to market-led check truncation and imaging, the Federal Reserve Board sent proposed legislation to Congress on this subject in December 2001. The proposed act is designed to facilitate check truncation by creating a new negotiable instrument called a substitute check, which would permit banks to truncate the original checks, to process the check information electronically, and to deliver substitute checks to banks that want to continue receiving paper checks. Several firms mentioned the potential benefits of the proposed act. One processor stated that with such a law, it would be able to move any check anywhere in the United States within four hours of receipt, which could eliminate one or more days from check clearing times.

At the same time, one bank expressed concerns about the industry's limited ability to support image exchange between processors and banks. Currently, image standards are generally proprietary and therefore may not be sufficiently interoperable to enable the easy exchange of images, such as among archives provided by different banks and vendors or using different data-compression techniques.²⁴ One bank stated that private-sector participants need to collaborate more in building image-exchange systems. The use of multiple formats for electronic check presentment files also increases processing costs and reduces efficiency because it increases the likelihood that files will be used only once rather than as source data for subsequent transmissions or stored and conveyed when needed. Also, despite increases in telecommunications capacity, many in the banking industry are concerned that capacity would be insufficient to support the widespread transmission of check images, which require large data files.

Interviewee Recommendations and Discussion

- *The Federal Reserve Banks should support the initiation and transmission of image and electronic check presentment (ECP) files from the Reserve Bank of first deposit. (one organization)*

Currently, check images and ECP files are captured at and transmitted from the Federal Reserve Bank office

that serves the paying bank.²⁵ This means that checks destined for a bank outside the depositing bank's region must be physically transported (frequently by air). The checks must also be physically sorted and reconciled at least twice by the Reserve Banks. If the Reserve Banks were to create the images and the ECP files at the Reserve Bank of first deposit, the Federal Reserve System could eliminate transportation costs and repeat processing. The Reserve Banks are currently exploring with the banking industry the feasibility of a pilot project to test transmission of ECP and image files from the Reserve Bank of first deposit.

- *The Federal Reserve Banks should support efforts to make image archives interoperable. (one organization)*

Banks and end users may store images in multiple archives (such as archives provided by the Federal Reserve Banks and by Viewpointe). One firm proposed that archive providers communicate in such a way that a bank or end user could retrieve all of its images through one access point regardless of the archive in which the images were stored. Thus, an image could be retrieved promptly without the end user or the bank needing to know its actual location. Such an arrangement might require contractual as well as technical agreements to address standard approaches to identifying the storage location of any particular check image. Currently, the Federal Reserve Banks are facilitating industry discussions on interoperability in electronic check processing and truncation to identify key barriers and areas for industry collaboration.

Real-time Transaction Processing, Clearing, and Settlement

Interviewees differed on how quickly a payments transaction should clear and settle—for example, in real time or near-real time or on the next day. Generally, their first thought was that clearing and settlement should always occur immediately to reduce risk. Further discussion, however, frequently revealed that alternative procedures might also enable firms to manage risk effectively. Not surprisingly, cost considerations weighed against real-time functionality in instances in which alternative, less-costly solutions could achieve similar results.

24. The Federal Reserve Banks, in their FedImage project, are working toward converting their diverse image-processing platforms to a standard, centrally managed national image archive.

25. In this report, ECP refers to presentment (as defined in the Uniform Commercial Code) through the transmission of the MICR (magnetic ink character recognition) information printed on the checks to the paying bank. Some private-sector providers of check services, in contrast, use the term ECP to refer to the transmission of MICR data but not to presentment; in these arrangements, receipt of the physical check constitutes presentment.

Real-time Clearing and Settlement

Several firms—end users, technology firms, some banks, and service providers—suggested developing a payments system capable of immediate and final funds transfers much like the current wire transfer systems but more broadly accessible to consumers and businesses and at a low price for general commercial use. The Securities Industry Association STP Payments Processing Subcommittee, for example, discussed the merits of such features for securities payments in its updated white paper and noted that these features do not currently exist in a single payments system.²⁶

Some interviewees noted the costs and difficulties of implementing the equivalent of a broadly accessible—perhaps on-line—wire transfer system. For example, transition costs could be substantial for banks that would need to modify their consumer deposit systems for real-time, on-line processing. Such systems now permit memo posting for debit card transactions, but further enhancements would likely be needed. Banks would need to modify their internal accounting systems and their interfaces with clearing and settlement systems. Legal and financial risk issues and, possibly, issues related to consumer protection would also need to be addressed. Further, some interviewees indicated that the business practices and management structures in end-user organizations, banks, and clearing organizations may not be sufficiently flexible to make the decisions needed to support the long-term development of faster payments processing or electronic commerce more generally. Some other interviewees also noted the apparent anomaly between the widespread availability of on-line, interactive capabilities on the Internet and the difficulties of developing real-time, on-line interbank payments systems that can be widely used in electronic commerce.

Real Time versus Near-real Time

A number of interviewees suggested that other procedures—procedures less-costly than real-time clearing and settlement—might enable firms to manage risk effectively. Several merchants and infrastructure providers noted that real-time payment guarantees, or at least real-time verification that the counterparty has good funds, followed by later settlement, might be adequate to support the current needs of electronic commerce without establishing new systems or making costly investments.

26. The white paper is available at www.sia.com/stp/pdf/Payments_White_Paper_v3.6_082902.PDF.

Several interviewees, however, noted that verification alone, without a final transfer of funds or a payment guarantee in real time, still presents risk. The acceptability of these alternative procedures apparently varies depending on the type and risk of the business transaction, such as the purchase of a car versus a book.

If recipients of payments are interested in receiving funds on a near-real-time basis, such as on the same day, financial industry efforts could focus on improving same-day interbank clearing and settlement procedures rather than on deploying a new, general, real-time funds transfer system. For instance, various parties—banks, processors, and corporate end users—suggested making same-day settlement more widely available for ACH transactions, which would speed up these payments and help manage risk.

Returned Payments

The speed with which returned payments reach the originating bank and the originator of the transactions, particularly for ACH debit transactions, was discussed by many interviewees. ACH debit transactions may be returned for several reasons, including insufficient funds to cover the debit or the use of an incorrect account number. Such returns may take several days—generally three or four business days—before the originator receives notice of the return.²⁷ In effect, the ACH system for debit transactions operates on the principle that “no news is good news.” In the meantime, however, the services or goods sold in exchange for an ACH debit may no longer be recoverable. There appears to be consensus that the return process for ACH payments places undue risk on originators, may lower the willingness of firms to use ACH debits for some types of transactions, and reduces the overall efficiency and

27. If an ACH payment is originated on a Monday (T) and settles on a Tuesday (T+1), it must be returned to the originating bank by Thursday morning (T+3). NACHA operating rules provide that a receiving bank (for a debit transaction, the paying bank) may return the transaction to the originating bank within two banking days following the settlement date of the original transaction if the transaction information is incorrect (for example, if it contains an invalid account number) or if the payor does not have sufficient funds to cover the debit. Once the originating bank receives the return notification, it sends notice to its customer. If the transaction was not authorized by the account-holding consumer, under Regulation E, the consumer must notify his bank of the unauthorized transaction within sixty days from the date his account statement was sent or his passbook documentation was made available to him. Under NACHA operating rules, the consumer's bank may return the transaction up to sixty days from the settlement date of the original transaction. The sixty-day timeframe for unauthorized transactions applies only to transactions involving consumer accounts.

increases the risk of the settlement of the underlying transaction. To address their risk exposure from ACH debit returns, firms currently manage risk on the basis of the typical return period. For example, an intermediary, such as a provider of billing services, that originates debit payments on behalf of originators (billers) may place a “hold” on the funds for three or four days before releasing them to the originator. While this practice may be effective in managing risk, it does not appear to be particularly efficient from the perspectives of funds and systems management.

Interviewee Recommendations and Discussion

- *The Federal Reserve should create a same-day ACH product. (two organizations)*

The Federal Reserve Banks are exploring the possibility of offering a same-day ACH product. Progress, however, depends on the willingness and ability of banks and processors to change their current business practices and make technology investments in faster back-end processing and posting systems. In the meantime, the Reserve Banks are working with several banks to develop a limited-scope pilot project. The project is expected to begin during 2003 and to run for several months.

- *To improve posting to demand deposit account systems, the Federal Reserve should increase the number of times per day banks must pick up files from their ACH operator. (one organization)*

The Federal Reserve Banks are exploring file-pickup issues related to a same-day ACH product. The Reserve Banks’ ACH system has the capability of distributing and allowing banks to pick up files multiple times a day, and beginning in September 2003, the Reserve Banks will be distributing files four times a day. The new distribution schedule, however, may not change the practice of most banks of picking up files only at the end-of-day cycle (generally between 3 a.m. and 6 a.m. ET). As part of this new schedule, the Reserve Banks will not also require more-frequent pickups (though at least one private-sector operator does require pickups more frequently). The reasons banks continue once-a-day pickups include system limitations at banks, the application of additional processing fees from service providers, resource constraints, and traditional business practices. Although they recognized these inhibiting considerations, some interviewees cited once-a-day pickups as an immediate concern that hinders the industrywide evolution of the ACH. In its paper “The Future Vision of the ACH

Network,” NACHA recommends examining the business case for receiving banks to pick up files more often and suggests working with ACH operators to explore a potential rule change to require an improvement in current business practices for picking up (and posting) files.

- *The financial industry should develop a uniform deposit directory or some other means of verifying account numbers, account status, and relevant information so that a business can verify the existence of a customer’s account. (six organizations)*

Several companies, such as Thomson Financial Publishing, have developed databases with a limited set of the information desired by those that made this recommendation. The premise of the suggestion is that more-comprehensive directories could reduce the risks, particularly the fraud risks, of initiating ACH payments, especially one-time transactions. Some processors believe that they could reduce or eliminate the hold period on funds received from ACH debits using such a system. The cost of developing and maintaining such a database, however, might negate the savings for corporate end users and processors gained by using ACH payments as an alternative to credit and debit card payments. Such a system also raises privacy and consumer-protection issues. That said, the management of fraud risk in on-line transactions continues to be an important issue.

- *The financial industry should shorten the return time for ACH debit payments to reduce the risks associated with debit transactions. Alternatively, the industry should create a means of confirming good funds. (four organizations)*

The average return time for an ACH payment is less than the average return time for a check payment of 5.5 days following the day of deposit.²⁸ Several of those interviewed, however, found this time frame excessive for an electronic payment. NACHA operating rules govern the ACH return time frame, and therefore NACHA would be the appropriate organization to review this issue.

- *The financial industry should create a time stamp on ACH items to help track a payment through the ACH process. (one organization)*

²⁸ The average return time for check payments is based on a survey conducted by the Federal Reserve Board (see “Report to the Congress on Funds Availability Schedules and Check Fraud at Depository Institutions,” October 1996).

One merchant processor expressed the belief that a portion of the return time for ACH debit transactions, which in its case exceeded the time permitted, was attributable to delays by either the receiving banks or its own bank. This processor suggested that a time stamp be included on ACH items to help track the return of an ACH transaction. The time stamp would enable the end user to determine whether banks involved in the transaction had complied with return time frames set forth under NACHA operating rules. To accommodate a time stamp, NACHA would need to modify its operating rules, and software providers and operators would need to change their ACH software.

- *The financial industry should explore means to reduce administrative ACH returns generated as a result of payable-through arrangements for check collection. (one organization)*

Some banks, generally credit unions, use payable-through arrangements for processing their check payments. In such arrangements, the bank uses the routing number of the payable-through bank rather than its own routing number on the MICR (magnetic ink character recognition) line of its checks. Consequently, when the bank's customers use the routing number printed on their checks for ACH transactions (for example, for check conversion), the transaction is routed to the payable-through bank, whose systems will not recognize the customer information and will return the transaction. These returns limit the usefulness of check conversion programs. In its paper "The Future Vision of the ACH Network," NACHA highlights addressing this issue as a high priority for future action.

- *The financial industry should develop a central directory for routing electronic payments. (two organizations)*

A central directory would provide an electronic payments "address" or allow payments system participants to access information on end users for the purpose of routing payments. Such a directory could reduce the number of transactions routed incorrectly and could lower some risks of initiating ACH payments. The cost of developing and maintaining such a database or of purchasing access to it, however, could reduce the savings from using the ACH. The Clearing House, in its UPIC project, is currently experimenting with a version of such a directory to support business-to-business payments.

Information Related to Electronic Payments

Many interviewees—including software vendors, infrastructure providers, and one bank—expressed the opinion that the ability to communicate and manipulate information about an underlying transaction is of greater value to a business than the potential savings from making or receiving electronic payments. The electronic transmission of information could enable firms to automate the reconciliation of the payment and other transaction information, thereby reducing manual intervention and permitting the wider integration of information resources within and across businesses. If the data are to be processed electronically, however, the information must be in an electronic format that enables the firm's software and hardware to process it straight through.

Straight-through Processing

System constraints and the lack of integration affect both corporations' and banks' ability to use payments information services. For example, corporations' accounts payable, accounts receivable, payments, and reconciliation systems continue to be less integrated than necessary for seamless handling of invoice and electronic payments information. Firms traditionally built reconciliation and related systems around checks and paperwork flows, and, therefore, legacy systems are generally not structured to handle electronic payments. In addition, larger banks tend to have separate deposit-accounting systems for consumers and corporate customers and may have multiple systems within these categories because of product segmentation or mergers and acquisitions. Some banks have linked systems, but others have not progressed very far in integrating their internal payments systems. This situation is not likely to be overcome quickly, and system and organizational changes may be necessary before significant progress is made.

Also, depending on the required investment, corporations may not have the necessary incentives to integrate widely their systems supporting payments and other operations. Interviewees noted that improved management of transaction-related information would need to provide the business with net benefits to justify the investment decisions. Some businesses are trying to automate and integrate their internal systems to improve business-to-business transactions, but not all companies are looking to, or investing to, improve integration. To put these issues in perspective, it is important to recognize that checks are still widely used by businesses to make vendor payments.

Information Flows

Interviewees differed on whether payment-related information should flow with an electronic payment or be matched up at the end of the process. Some, mostly current or former bankers, favor sending the information along with the payment, such as with financial EDI (electronic data interchange), because the transmission would use existing network infrastructure.²⁹ Others believe that such an approach would increase the number of parties handling the data and threaten the integrity of the information. For example, data might be truncated because many banks—even fairly large banks—are not equipped to deliver data unrelated to payments effectively. Timeliness of receiving the information was also an issue for interviewees, as was the possibility that banks would impose charges for handling non-payment data. In addition, one corporate interviewee supported the continued use of existing general-purpose electronic information systems to share information related to payments between counterparties. Payment-related information can flow through these systems and be matched with the payment in the receiver's systems. This interviewee also believed that having a separate information system specifically for payment-related information would lead to inefficiencies in business processes.

Interviewee Recommendations and Discussion

Several firms interviewed—including technology firms, financial services providers, and other service providers—currently offer a variety of means of reconciling payments and related information at the originating and receiving ends of transactions. In general, while the interviewees discussed the value of payments-related information at some length, they did not make specific suggestions for action by the Federal Reserve or the financial industry. It may be that concerns regarding payments-related information did not rise to the same level of concern as other issues identified by the interviewees. Corporate end users frequently pointed out that payments information is a critical but small part of the information these businesses must manage.

²⁹ EDI is the electronic transmission of data in a standard format for documents typically exchanged between trading partners, including purchase orders, invoices, and remittance advices. When a payment instruction and electronic data are combined, the transaction is called a financial EDI. While EDI and financial EDI are used in certain industries, they have not been widely adopted.

Standards

The discussion of standards tended to revolve around the desirability of broad interoperability across payments systems and payment instruments. Representatives of several firms—software providers, processors, and banks—expressed frustration about the divergent standards and the lack of cooperation on the part of certain industry segments. They perceived the lack of agreed-upon message standards and the resulting lack of interoperability as the greatest problem for the financial industry.

Cooperation

Concerns about interoperability and standards arose in several discussions. They were largely directed at software vendors that are creating proprietary formats for software that are not compatible with the formats used by other vendors. A number of interviewees believe that when they choose to use particular software, they become locked into a format that limits interoperability. Small banks, for example, expressed concerns about the inconsistency of formats deployed by third-party payments processors. They also noted their inability to get service and software providers to make software changes unless those changes were mandated by larger players (for example, a change in a regulation or a NACHA rule). More than ever, software vendors play a key role in the development of payments systems and can influence the adoption of electronic payments capabilities by both banks and businesses.

Universal Format

Some interviewees discussed the concept of a universal payment-message format, one that uses a common format for several types of electronic payments but might maintain separate clearing channels or business rules for each type. The existence of multiple payment-message formats, such as the formats for ACH, wire transfers, and other electronic payments, increases the cost and complexity of payments processing; a universal payment-message format, in contrast, could in theory improve efficiency and reduce cost. For example, costs attributable to maintaining separate operational support and business staffs for each distinct system could be reduced. Interviewees discussed using XML to define a universal format, because the use of a common set of XML message tags would allow inconsistent message formats to be understood and processed. Interviewees noted that although XML is becoming

more widely used, there are important questions to be addressed. These include how to transmit data efficiently and how to reach agreement on a common set of tags. In particular, the fact that some organizations have already developed internal XML standards would likely make agreement on an industry standard difficult. In addition, as one technology firm noted, during a transition period, the universal format would simply be one more standard among many. On balance, however, the interviewees recognized that further work on XML-based payments standards could yield benefits. One possible approach mentioned by interviewees would be for larger payments organizations to work together, as appropriate, to review XML-based payment-message standards and seek areas of agreement on common standards.

Channel Migration

Other firms expressed a desire for a single operational channel through which all payments transactions would flow regardless of the format or rules that govern different types of payments. For instance, the single channel could carry payments flows from the end user to a third party that would translate the payments information into the relevant formats for submission to a bank. Some software providers are exploring (and a few have built) such a channel for end users. In addition, some banks like the idea of a single channel through which payment instructions would flow into multiple payments systems (such as Fedwire, Clearing House Inter-Bank Payments System (CHIPS), CLS Bank International, and ACH). These banks also expressed interest in the possibility of a unified settlement system that processes payments through a single channel in various modes (real-time, end-of-day, queuing, timed, conditional, and so on) according to the sender's instructions.

By contrast, interviewees suggested that other banks, particularly those with large payments operations, may not be interested in a single channel, a unified settlement system, or a universal format. They have sufficient volumes to recover the fixed costs (including the cost of communication links) of participating in several payments systems and have built up payments services around these separate systems. For this reason, some banks and service providers stated that the existence of several standards is not a problem and that banks (often supported by nonbanks) are in the business of converting messages among formats when necessary. In addition, the organizational complexity of banks

(which have traditionally segmented payments processing by payment type) may, as a practical matter, slow the development of simplified forms of clearing and settlement.

Cross-border Issues

The lack of standards, particularly in payment-message formats, contributes significantly to the cost and difficulty of cross-border electronic payments. Several interviewees—banks, financial services providers, infrastructure providers, and others—pointed to a need to harmonize the message formats for file and wire transfers across countries or regions.³⁰ Correspondent banks currently supply format-translation services. Greater standardization of formats has the potential to reduce costs for correspondent banks, increase straight-through processing, and improve service for their customers. One bank also mentioned that as a global bank, it faces additional cost and complexity from accommodating and then translating for internal use different wire transfer formats for different countries. For example, the euro area generally uses SWIFT standards, while the United States continues to use proprietary standards for wire transfers (and NACHA standards for the ACH).³¹ Such banks are generally encouraging greater uniformity among central banks' wire transfer formats.

Interviewee Recommendations and Discussion

- *The Federal Reserve should help develop cross-border standards for file transfers. (three organizations)*

The Federal Reserve Banks have arranged to work with SWIFT, which operates an international inter-bank messaging service, on its efforts to develop an XML-based standard for file transfers. Also, a group sponsored by NACHA, the Global Payments Forum, has formed a format work group to address the matter of interoperability of ACH transfers globally. A Reserve Bank staff member participates in and serves as vice chair of the forum's steering com-

30. Wire transfers have only one payment instruction per transfer, while file transfers can include multiple payment instructions.

31. The Federal Reserve Banks' and the Clearing House Inter-Bank Payments System's (CHIPS's) proprietary message formats for wire transfers are, however, SWIFT-compatible. In other words, the wire transfer and SWIFT formats have the same essential fields, which enables banks to map the information required to process the transaction from one format to the other. The Federal Reserve first adopted a SWIFT-compatible format (but not a SWIFT format itself) in 1997 (60 FR 111, January 3, 1995).

mittee. These efforts may be first steps in the development of a more global approach to cross-border standards for file transfers.

- *The Federal Reserve should facilitate the development of standards for electronic payments and should work with vendors to promote those standards. (two organizations)*

The Federal Reserve Banks have dedicated, and will continue to dedicate, staff to work with payments and standards organizations, as appropriate, to set standards for electronic payments and processes. For instance, the Reserve Banks and other industry experts serve on an Accredited Standards Committee X9 work group focused on modifying the ECP standard.³² The Reserve Banks are planning to work with vendors to ensure that banking software is, by 2005, compliant with the revised standard.

Cross-border Payments

Several interviewees, especially representatives of corporate end users and financial services providers, characterized cross-border payments as quite costly and cumbersome.³³ Cross-border payments include business and personal payments, such as money transfers by U.S. residents to family members in foreign countries. These payments, especially personal payments, typically involve an explicit fee in addition to implicit or explicit charges for foreign exchange conversions; the principal amount of the payment may also be subject to deductions by parties to the transaction.³⁴ Interchange fees for cross-border credit card payments are also perceived to be costly, and some retailers and financial services providers suggested that alternatives to credit card payments would be helpful in international on-line commerce, particularly when it involves countries in which the use of credit cards is not widespread.

Several interviewees—representatives of end users, financial services providers, infrastructure providers, and other organizations—believe that the banking and technology industries do not have the financial incentive to create a faster and lower-cost cross-

border payments process, even when pressured by government intervention. They point to the fact that in 1997, the Commission of the European Communities (European Commission) issued a directive that the private sector improve the conditions for making payments across the borders of countries in the European Union. In September 2001, the commission then issued a regulation that requires the price for a cross-border payment to be no greater than that for a domestic payment.³⁵ The commission found that the cost of a €100 cross-border credit transfer had increased slightly from 1999 to 2001.³⁶

Notwithstanding the lack of financial incentives to create a faster and lower-cost cross-border payments process, banks may incur high costs in making these payments. Many cross-border payments depend on multiple correspondent banks and may involve significant manual processing and multiple format translations to deliver payments. The processing of returns can be even more cumbersome and time consuming.

Interviewee Recommendations and Discussion

- *The Federal Reserve should begin a central bank initiative on cross-border payments. (two organizations)*

In 1998, the Federal Reserve System's Committee on the Federal Reserve in the Payments Mechanism (also referred to as the Rivlin Committee) recommended that the Federal Reserve support cross-border ACH transactions and work with the industry to develop cross-border ACH capabilities. Since then, the Federal Reserve Banks have begun providing cross-border ACH services to Canada and have explored opportunities to expand their commercial international ACH service to other countries. For example, the Federal Reserve and the Banco de Mexico have agreed to explore the possibility of establishing a connection between ACH systems that would provide an efficient mechanism for the interbank exchange of file transfers between the United States and Mexico and would be widely accessible to banks. In general, the Reserve Banks

32. The Accredited Standards Committee X9 works with the financial services industry to develop, maintain, and promote standards for financial products and services and is accredited by the American National Standards Institute.

33. Very little systematic information is currently available about the volume of cross-border payments between the United States and other countries.

34. In response to concerns about the cost of remittance payments, President George W. Bush and President Vicente Fox of Mexico have endorsed a joint effort between the United States and Mexico, Partnership for Prosperity, that has as one item in its action plan the reduction of the cost of remittance payments between the United States and Mexico.

35. In addition to credit transfers, the regulation covers cross-border card payments and ATM transactions. See http://europa.eu.int/comm/internal_market/en/finances/payment/area/ec01-2560_en.pdf.

36. A subsequent, but not completely comparable, survey published by the Commission of the European Communities indicates that the average total cost for a credit transfer of €100 was €24.09 (comprising €22.70 charged to the originator, €1.19 charged to the beneficiary, and a foreign exchange loss of €0.20). See "Study on the Verification of a Common and Coherent Application of Directive 97/5/EC on Cross-Border Credit Transfers in the 15 Member States: Transfer Exercise," by the Commission of the European Communities (September 17, 2001).

are increasingly focusing on cross-border arrangements to support the exchange of both commercial and government ACH transactions.

Laws, Regulations, and Private-sector Rules

Most interviewees appeared to take regulations as a given, something to be worked with or around, not changed (although, clearly, some organizations do pursue regulatory changes). Many viewed payment-related laws and regulations as complex, confusing, and causing uncertainty. Private-sector rules pose similar problems. At the same time, few interviewees made specific suggestions for improving the legal and regulatory environment to foster greater innovation.

Clarity and Certainty

One bank and service provider stated that they believed that current regulations related to payments and other matters are too complex and confusing, not only for consumers but also for banks and businesses. This view is not necessarily a new one, but it has been strengthened by the introduction of hybrid payments products that can cross regulatory boundaries. Laws, regulations, and private-sector rules often reflect, and are shaped by, the technology underlying the payment, for example, whether the payment is based on paper or electronic media. As payments systems have evolved, however, the distinction has become less clear-cut. An example is point-of-sale check conversion: Initially, service providers and participants had not fully worked out the legal framework that applied to checks converted to ACH or retail electronic funds transfers at the point of sale or at lockbox processors. In response to concerns about which laws and regulations governed check conversion, the Federal Reserve Board in March 2001 published revisions to the staff commentary to Regulation E to provide guidance on electronic check conversion transactions when a consumer authorizes the use of a check to capture information for initiating an electronic debit from the consumer's account.³⁷ The development of hybrid products also raised concerns about differing regulatory treatment that depends on the nature of the transactions. For instance, when a check is used directly as a payment instrument, the transaction

is covered under check laws (such as articles 3 and 4 of the Uniform Commercial Code), but if a check is used merely as a source of information to create an ACH (or other electronic) debit, the transaction is covered by electronic fund transfer laws (such as Regulation E).

Infrastructure providers and one bank also cited uncertainty regarding the effects of state or federal privacy restrictions on the ability to authenticate payors and payees, as well as related concerns regarding interpretations of money laundering laws and restrictions imposed by the U.S. Department of the Treasury's Office of Financial Assets Control. Some interviewees—a bank, a service provider, and an infrastructure provider—also expressed the belief that these laws and directives, as interpreted, were more burdensome than intended and that they adversely affected the development of payment instruments and systems, especially those crossing borders. Finally, the service provider and one of the private-sector rule-making organizations noted that the disparity in laws, rules, and practices among countries make cross-border payments arrangements much more difficult to address. It was suggested that a more global perspective on the part of U.S. policy-makers when enacting laws might help overcome some of these difficulties.

Periodic Assessments

The interviewees encouraged the periodic assessment of laws and regulations in light of changing market developments to allow for innovation and improvements in the payments system. They also encouraged the Federal Reserve to continue to foster open dialog and to adjust the regulatory structure to accommodate reasonable change.³⁸ Several interviewees raised similar concerns about private-sector rules and encouraged their examination periodically to ensure that the rules keep pace with technology and the market. Further, two interviewees expressed concern that in their view, payments regulations can be used inappropriately, for example, by restricting legitimate electronic or other commerce through limitations on payments systems designed to address social concerns such as cross-border gambling over the Internet.

37. The revised staff commentary also provides guidance on electronic authorizations permitting recurring debits from a consumer's account and other matters.

38. Federal agencies are required by statute to conduct periodic reviews of their regulations (5 U.S.C. §610). The Board's policy is to review its regulations at least every five years with a view toward eliminating or simplifying them and easing burdens imposed by them (*Federal Reserve Bulletin*, vol. 65 (January 1979), p. 137; Federal Reserve Regulatory Service ¶8-040).

Regulation versus Self-regulation

Generally, the interviewees believe that there is a delicate balance between public-sector regulation and private-sector self-regulation. One service provider expressed the view that regulations, such as Regulations E and Z (which cover electronic fund transfers and truth in lending, respectively), create a national standard for consumer protection that otherwise would have to be developed by individual players or groups on a case-by-case basis, saving individual firms that are developing innovations considerable development costs and time. A number of interviewees also believe that premature regulation can hamper innovation in the market. One law firm noted that even the possibility of regulation can have a chilling effect and can have unintended consequences for the design of financial products and services.³⁹

The interviewees generally believe that private-sector rules can establish minimum requirements for the parties to covered transactions, providing an often-effective form of self-regulation. Private-sector organizations that create these rules can determine such things as how risk will be allocated to the participants, the technical specifications for processing, and the business standards for involvement with the network, thereby affecting all aspects of direct, and in some cases indirect, participants' interaction with the network, such as formats, technical standards, and fees.⁴⁰ Several service providers believe that establishing agreed-upon rules is considerably more difficult and more costly than resolving the technical issues that arise in new projects. Yet the effort may be just as important, perhaps more so.

At the same time, several interviewees described their frustration with the rule-making process employed by some organizations. For example, some organizations are said to focus too much on the details and lose sight of broader objectives when developing technical standards. It is believed that the current process does not allow for sufficient input from the business areas of banks and other firms in the writing of technical specifications. Further, one interviewee suggested that the development of these standards is much too slow for a technologically advanced society.

39. For a discussion of these issues in the context of the application of Regulation E to stored-value products, see the Report to the Congress on the Application of the Electronic Fund Transfer Act to Electronic Stored-Value Products (March 1997), available at www.federalreserve.gov/boarddocs/rptcongress/efra_rpt.pdf.

40. Private-sector rule-making organizations include entities that operate the network to which the rules apply (such as credit card associations) as well as entities that bind the parties to the rules through agreements but do not operate the network (such as NACHA).

Interviewee Recommendations and Discussion

- *The Federal Reserve should evaluate and, if possible, simplify payments law. The Federal Reserve should consider creating a unified structure for all payments methods, which would avoid the difficulties associated with hybrid forms of payments. (two organizations)*

Many of the laws that govern payments, especially articles 3 and 4 of the Uniform Commercial Code (UCC) governing checks and other negotiable instruments and article 4A governing payment orders, have historically been (and continue to be) written and revised in response to commercial practices. In essence, rules tend to follow rather than lead payments practices. This process has also meant that heterogeneous payment instruments have resulted in heterogeneous laws—laws that may be confusing at times but may also provide differentiation among payment instruments with respect to their allocation of various types of obligations and liabilities that is of value to end users.

Adoption of a unified structure of payments law is significantly beyond the jurisdiction and role of the Federal Reserve. State legislatures and Congress play fundamental roles in writing payments law. For instance, the UCC is modified and adopted by state legislatures. In the past, there have been attempts to create unified payments law, but these have encountered problems.⁴¹ To the extent that the Federal Reserve Board has responsibility for payments-related regulations, it intends to work with the private sector to identify and address, when appropriate, barriers to innovation, and to revise its rules and recommend legislative changes when appropriate. For example, in March 2001, the Federal Reserve Board revised its staff commentary to Regulation E to provide guidance on electronic check conversion services and other matters.

- *The Federal Reserve should assess and modify, if appropriate, the limitations on withdrawals imposed on savings deposits by Regulation D. (one organization)*

One bank noted that Regulation D's monthly limits on transfers from savings accounts using electronic access devices, such as ATM cards, may constrain

41. In the 1970s, the Permanent Editorial Board for the Uniform Commercial Code formed a committee, which included representatives of the Federal Reserve, to examine UCC articles 3, 4, and 8 in light of recent technological developments. The committee's mission was to determine if these articles should be revised to reflect the new technological environment. By the early 1980s, however, the committee had dropped the effort because of a dearth of support from the banking industry and payments service providers for a uniform payments code. The committee instead focused on a code for electronic funds transfers, which became article 4A of the UCC.

product innovation. The Federal Reserve does not believe that the Regulation D limitation on transfers from savings accounts is a significant deterrent to payments product innovation, given that those limitations do not apply to transaction accounts, which are widely used to make customer payments. Nevertheless, the Federal Reserve Board is currently reviewing Regulation D to determine whether its transfer limitation provisions can be streamlined.

- *The Federal Reserve should explore whether the commentary to Regulation E should be revised to clarify the technical implications of the stop-payment provision. (one organization)*

A law firm questioned how the staff commentary in Regulation E, section 205.10 (c), on stop-payment orders for recurring payments should be interpreted and suggested that this provision may be too prescriptive. The Federal Reserve Board staff is reviewing the staff commentary on this matter.

- *If the proposed Check Truncation Act, or some variant, is enacted, the Federal Reserve should again consider eliminating the Federal Reserve's "six-hour monopoly" on check presentment. (one organization)*

Under the Uniform Commercial Code, the Federal Reserve Banks may present checks to a paying bank by 2 p.m. local time and receive settlement in same-day funds. All other presenting banks must present checks by 8 a.m. local time (under the same-day settlement provisions of Regulation CC) to receive similar settlement that day.⁴² Some industry observers have referred to this difference as a "six-hour monopoly." In 1998, the Federal Reserve Board requested public comment on whether it should modify Regulation CC to reduce or eliminate the difference. The response was strong that the Board should not change Regulation CC, and the Board took no action at that time.⁴³ Most commenters did not believe that the six-hour monopoly was a significant impediment to the ability of private-sector collecting banks to compete with the Reserve Banks. Seventy-five percent of all commenters favored not changing Regulation CC primarily because the additional costs incurred by paying banks outweighed the benefits gained by collecting banks. As the check environment changes, however, the Board could once again request comment on reducing or eliminating this legal disparity between the Reserve Banks and private-sector banks.

- *Public authorities should clarify privacy laws, in part to provide better guidance in light of the current focus on stopping funding for terrorist organizations. (three organizations)*

Congress determines privacy laws and the extent of the agencies' regulatory authority related to consumer privacy. Congress has historically approached privacy matters in terms of specific situations and information that raised concerns. Where Congress has given multiple federal agencies rule-writing authority, the agencies have worked together to develop common rules and interpretations to minimize confusion and level the playing field for affected institutions. For example, the Financial Services Modernization Act (Gramm-Leach-Bliley Act) addressed the protection of consumer financial information.⁴⁴ After this law was enacted, the Federal Reserve Board and other federal regulatory agencies promulgated regulations for financial institutions relating to the privacy of consumers' financial information. The agencies worked closely to write consistent rules and continue to work together to achieve consistent interpretations of various issues that arise under the rules. In addition, the Federal Reserve Board and other federal regulatory agencies are working with the Treasury Department to develop consistent regulations to implement the customer identification and verification requirements of the USA PATRIOT Act.⁴⁵

If specific provisions of these or other regulations create confusion, questions and comments should be sent to the appropriate authority for consideration. Undoubtedly, additional time will be needed to work through and test these relatively new regulations before the effects on the private sector are better understood.

- *The card associations should establish a merchant advisory group or some other means of providing merchant input into the credit card associations' rule-making process. (two organizations)*

Private-sector rules typically determine the rights, responsibilities, and other key aspects of participation in a particular private payments system or network. It is for this reason that merchants want a greater role in setting the policies and rules for the card associations, particularly when fees and other matters that affect them are being considered. A particular concern is that the levels, structure, and distribution of fees can significantly influence business expenses in conducting electronic commerce. At least one card

42. 12 CFR part 229.36(f).

43. 57 FR 46956, October 14, 1992; 63 FR 68701, December 14, 1998.

44. Public Law 106-102, Title V (1999), codified at 15 U.S.C. §6801 *et seq.*

45. Public Law 107-56, §326 (2001).

association has taken limited steps to have an officer represent merchant views more fully within the organization.

Federal Reserve Services and Miscellaneous Topics

Some interviewees made recommendations concerning the Federal Reserve's financial services. Some of the recommendations addressed perceived barriers to future innovation. Others involved service enhancements that the interviewee would find beneficial. These recommendations, as well as recommendations on other topics, are discussed below.

Interviewee Recommendations and Discussion

- *The Federal Reserve should explore options for nonbank access to Federal Reserve information, clearing, and settlement services. (four organizations)*

Nonbank infrastructure providers and merchants raised questions about the laws and policies that generally limit to banks direct access to Federal Reserve Bank services. They believe that direct access to information, clearing, and settlement services provided by the Reserve Banks would enable them to expand their services and to process payments more efficiently and at a lower cost.⁴⁶ Recently, several central banks have considered granting, and some are granting, account services to nonbanks, provided specific conditions are met (the conditions vary from central bank to central bank).⁴⁷ While the Reserve Banks provide direct access to payments services and Federal Reserve accounts only to banks and certain other organizations as provided by law,

46. One financial services provider complained that the added step of sending its ACH payments through an intermediary significantly decreases the window for submitting payments for ACH processing. Another provider reported experiencing delays in ACH payments returns, in part because of the internal processes of its banking intermediary. In addition, one infrastructure provider wanted access to an account at a Federal Reserve Bank to conduct settlements rather than having to use a bank to conduct such operations. Several banks, however, expressed concerns regarding increased risk to the payments system and greater fragmentation in the U.S. market should nonbanks be granted access to central bank services. Some acknowledged that their views are influenced by the competitive advantages they enjoy by having such access.

47. Two G-10 countries as well as Australia have changed the criteria for access to central bank account services. As far back as March 1999, the Reserve Bank of Australia widened its eligibility for exchange settlement accounts (www.rba.gov.au/MediaReleases/1999/mr_99_02.html). More recently, the Canadian Payments Act was amended to open membership in the Canadian Payments Association to life insurance companies, securities dealers, and money market

some of the Reserve Banks' information, clearing, and settlement services are intended to foster efficiencies resulting from nonbank participation in the payments system. For example, the Reserve Banks offer a national settlement service that allows settlement agents (both nonbanks and banks) acting on behalf of the agents' participating banks to submit settlement information electronically for processing and automatic posting to the banks' Federal Reserve accounts.

- *The Federal Reserve should remain in the ACH business and keep its prices low to ensure that the ACH continues to be a low-cost payment option. (two organizations)*

As recently as 1998, the Federal Reserve, through the Rivlin Committee, assessed its check and ACH services to determine if it should remain in these businesses and concluded that it should (www.federalreserve.gov/boarddocs/press/general/1998/19980105). Each year, the Reserve Banks propose the prices of these services for approval by the Federal Reserve Board in an annual repricing exercise conducted to comply with the Monetary Control Act of 1980. Prices are posted publicly at the end of the exercise, as are any changes throughout the year, at www.frbsservices.org.

- *The Federal Reserve should continue to create greater uniformity among the Federal Reserve Banks in their prices and the products and services they offer. (one organization)*

The Federal Reserve Banks are working on and will continue to strive toward greater uniformity in their pricing and the products and services they provide, where appropriate. Several initiatives are under way to increase the uniformity of priced services, particularly check processing.⁴⁸ The electronic priced services—Fedwire Funds, Fedwire Securities, National Settlement, and ACH—are already uniform across the Reserve Banks in terms of prices and

mutual fund companies (www.bankofcanada.ca/en/ and www.cdnpay.ca/home/home.asp). In November 2002 the Bank of England published its policy for providing payments systems and their members access to settlement accounts (www.bankofengland.co.uk/financialstability/paymentsystems/boesettleaccs021128.pdf).

48. The Federal Reserve Banks have undertaken a check modernization initiative to standardize and reengineer their infrastructure for processing checks over the next several years. The initiative consists of four key projects, each addressing a critical aspect of the check-clearing process: converting separate processing platforms to a standard, centrally managed platform; establishing a standard, centrally managed image platform that has a national image archive; moving check adjustments to a common platform that uses shared data; and offering over the Internet check products that are now available on DOS FedLine.

service offerings. In 2001, the Reserve Banks established a national office for customer-related initiatives, the Customer Relations and Support Office, charged with promoting uniform services across all product delivery channels and communications vehicles.

- *The Federal Reserve should establish longer Fedwire hours in the evening to support later internal settlement cutoff times for banks. (one organization)*

One credit card association expressed interest in longer hours for Fedwire funds transfer processing to enable the association to settle more of its transactions for the day. The current hours—12:30 a.m. to 6:30 p.m. (ET) Monday through Friday—limit the number of credit card transactions the association is able to clear and settle on the same day. The Federal Reserve Banks have been exploring with the private sector the possibility of extending hours both at the beginning and the end of the day. Current industry interest appears to indicate a preference for opening earlier to accommodate business dealings in different time zones, specifically the Asian markets. Earlier hours will not, however, address the card association's desire to settle more transactions later in the day. The Federal Reserve issued a request for comment on extended hours in December 2002.

- *The Federal Reserve should establish weekend electronic payments services to support weekend banking. (one organization)*

An on-line merchant expressed interest in weekend processing of Fedwire transactions so that it could receive funds for orders taken on nonbanking days. Weekend processing of Fedwire transactions would require that the financial industry have full access to deposited funds and investment mechanisms. Numerous entities (including the Federal Reserve Banks, commercial banks, and financial markets) would need to expand their hours. Such an extension would increase operating costs and could significantly burden banks, infrastructure providers, and others. In September 2002, the General Accounting Office issued a report, "Weekend Settlement: Potential Benefits, Costs, and Legal Issues," that examined the weekend settlement of financial transactions. The report concluded that the "weekend settlement of financial transactions would provide small benefits to retailers and consumers, and little, if any, benefit to the economy as a whole."⁴⁹

- *The Federal Reserve Banks should use their network to enable others to deliver images. (one organization)*

One firm—a processor—expressed the belief that the Federal Reserve could facilitate a reduction in paper processing by permitting (presumably for an appropriate fee) others to use its network to transmit images of checks for clearing and settlement. The recommendation was based on the fact that the Federal Reserve Banks' electronic network touches more bank endpoints than that of any other organization that conducts clearing and settlement operations. The Federal Reserve has not considered assuming such a role. The Reserve Banks' imaging services are part of its overall check collection service, which is available only to banks and certain other organizations as provided by law.

- *The financial industry should evaluate options for making deposit account information at banks (or similar accounts at other institutions) portable. (two organizations)*

Portability would allow a bank customer to switch banks without updating information that facilitates payments flows, such as information related to recurring ACH transactions. One ongoing initiative is the Clearing House's UPIC project, whereby a business is permanently assigned a unique electronic payment address, called a UPIC number. This number remains with the business even when it changes its banking relationships and could be a first step toward making deposit account information portable. This project, however, is still at a relatively early stage of development.

- *The financial industry should expand the field for the dollar amount in the ACH message format to accommodate larger-value payments on the ACH. (one organization)*

A processor of tax payments reported that the dollar limitation on ACH messages, \$99,999,999.99, made it necessary for several taxpaying businesses to break up their payments. The advantages and risks of large-value ACH payments have been discussed for many years, but no concrete conclusions have been reached. Increasing the limit would require a format change under NACHA operating rules as well as ACH software modifications.

49. General Accounting Office, "Weekend Settlement: Potential Benefits, Costs, and Legal Issues," Report GAO-02-938 (September 2002). A copy of the report is available at www.gao.gov/.

Appendix A: Contributing Federal Reserve Staff Members

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Appendix B: Interview Process and Potential Limitations

From October 2001 through March 2002, members of the Federal Reserve staff met separately with representatives of forty-nine organizations to seek their views on payments system developments and key issues that will shape the future of clearing and settlement for retail electronic payments. The organizations chosen for interviews represent a wide range of perspectives, although clearly they are only a sample. They fall roughly into eight categories of payments system participants: corporate end users, software providers, financial services providers, other service providers, payments processors, banks, infrastructure providers, and other interested parties.⁵¹ Interviews were conducted with six to eight organizations in each category except other service providers (two organizations) and processors (four organizations). Table 1 (in the text) provides a brief description of each category.

The represented organizations interact in various ways with the payments system, and their experiences have taught them a variety of lessons. In each interview, Federal Reserve staff asked about the organization's efforts to provide new payments or payments-related services and about barriers to change encountered by the organization. Although the interviewers asked about barriers to innovation in general and for recommendations related to all aspects of the payments system, they most strongly encouraged interviewees to talk about the areas with which they were most familiar.

Almost all the interviews involved face-to-face meetings at which, on average, three members of a Federal Reserve staff interview team were present. The interview team was composed of seven staff members from around the Federal Reserve System (see appendix A). The backgrounds of these individuals were largely in the areas of payments system policy and economic research.

In advance of the interviews, a short discussion paper intended to help frame the discussions was sent to interviewees.⁵² The paper outlined issues initially identified by the interviewers relating

to the future of payments systems and posed a number of questions intended to spark broader comment and discussion. The major topics covered by the paper included the desirable characteristics of payments systems, potential limitations of core systems, opportunities and challenges in technology, and future payments system design.

The interviews typically began with Federal Reserve staff explaining the context for the interviews generally. The explanation included a description of the Payments System Development Committee and its project concerning the future of clearing and settlement systems. The interviewees then generally described their organization's services and any new initiatives. The remainder of the discussion varied by organization and the issues or barriers each wanted to bring to the Federal Reserve's attention. The interview team specifically inquired about barriers to innovation throughout and at the conclusion of each interview. In some cases, the interviewee had prepared in advance a list of issues and concerns he or she wanted to discuss. Each interview lasted two to three hours.

Design and circumstances somewhat affected the interviews. Because of time and resource constraints, the number of organizations interviewed had to be limited. Although forty-nine was a substantial number and these organizations provided considerable information, the interviews should be seen as providing a range of views but not as constituting a scientific survey of opinions about the future of retail electronic payments for clearing and settlement. One unforeseen complication was the timing of the interviews. Most of the interviews had initially been planned for a period including September 11, 2001. A number of interviews, including those with representatives of organizations located in New York City, were postponed, and a few were not ultimately completed.

Notwithstanding the limitations described, the interviews were very informative and should help give the financial industry and the public insights into the challenges and opportunities for the future development of retail electronic payments, clearing, and settlement systems.

51. The individuals interviewed and the organizations they represent are not identified by name in this report, though the organizations are often referred to by category. The identities of the individuals and organizations are confidential information. Whenever a company name is used, the information is already in the public domain.

52. To obtain a copy of the discussion paper, "Discussion Note on the Future of Clearing and Settlement Systems for Payments," contact the Federal Reserve Board via mail at Board of Governors of the Federal Reserve System, Publications Fulfillment, Mail Stop 127, Washington, DC 20551; via phone at (202) 452-3245; or via e-mail at publications-bog@frb.gov.

Appendix C: A Summary of Recommendations from the Interviews

Innovations in the market environment

- The Federal Reserve should encourage innovation in electronic payments and support innovative private-sector payments projects through its operations or other means. (Recommended by eight organizations)
- The financial industry should work with vendors of bank software and other service providers to facilitate greater use of electronic payments. (two organizations)
- The Federal Reserve Banks should set a dollar limit on checks that they process. Payees would need to arrange for alternative, electronic payments for amounts above the limit. (two organizations)

On-line payments from deposit accounts

- The financial industry should facilitate the on-line transfer of funds from deposit accounts. (six organizations)
- The Federal Reserve should support the creation of authentication techniques and should require the authentication of consumers in on-line transactions. (one organization)
- The Federal Reserve should support the creation of an authority that certifies that a payments product or service is safe and protects the privacy of end users. (one organization)
- The Federal Reserve should help promote digital certificates and perhaps serve as a root authority that would issue and certify digital certificates. (one organization)

Transition of check payments from paper to electronic

- The Federal Reserve Banks should support the initiation and transmission of image and electronic check presentment (ECP) files from the Reserve Bank of first deposit. (one organization)
- The Federal Reserve Banks should support efforts to make image archives interoperable. (one organization)

Real-time transaction processing, clearing, and settlement

- The Federal Reserve should create a same-day ACH product. (two organizations)
- To improve posting to demand deposit account

systems, the Federal Reserve should increase the number of times per day banks must pick up files from their ACH operator. (one organization)

- The financial industry should develop a uniform deposit directory or some other means of verifying account numbers, account status, and relevant information so that a business can verify the existence of a customer's account. (six organizations)
- The financial industry should shorten the return time for ACH debit payments to reduce the risks associated with debit transactions. Alternatively, the industry should create a means of confirming good funds. (four organizations)
- The financial industry should create a time stamp on ACH items to help track a payment through the ACH process. (one organization)
- The financial industry should explore means to reduce administrative ACH returns generated as a result of payable-through arrangements for check collection. (one organization)
- The financial industry should develop a central directory for routing electronic payments. (two organizations)

Information related to electronic payments

- None.

Standards

- The Federal Reserve should help develop cross-border standards for file transfers. (three organizations)
- The Federal Reserve should facilitate the development of standards for electronic payments and should work with vendors to promote those standards. (two organizations)

Cross-border payments

- The Federal Reserve should begin a central bank initiative on cross-border payments. (two organizations)

Laws, regulations, and private-sector rules

- The Federal Reserve should evaluate and, if possible, simplify payments law. The Federal Reserve should consider creating a unified structure for all payments methods, which would avoid

the difficulties associated with hybrid forms of payments. (two organizations)

- The Federal Reserve should assess and modify, if appropriate, the limitations on withdrawals imposed on savings deposits by Regulation D. (one organization)
- The Federal Reserve should explore whether the commentary to Regulation E should be revised to clarify the technical implications of the stop-payment provision. (one organization)
- If the proposed Check Truncation Act, or some variant, is enacted, the Federal Reserve should again consider eliminating the Federal Reserve's "six-hour monopoly" on check presentment. (one organization)
- Public authorities should clarify privacy laws, in part to provide better guidance in light of the current focus on stopping funding for terrorist organizations. (three organizations)
- The card associations should establish a merchant advisory group or some other means of providing merchant input into the credit card associations' rule-making process. (two organizations)

Federal Reserve services and miscellaneous topics

- The Federal Reserve should explore options for nonbank access to Federal Reserve information, clearing, and settlement services. (four organizations)

- The Federal Reserve should remain in the ACH business and keep its prices low to ensure that the ACH continues to be a low-cost payment option. (two organizations)
- The Federal Reserve should continue to create greater uniformity among the Federal Reserve Banks in their prices and the products and services they offer. (one organization)
- The Federal Reserve should establish longer Fedwire hours in the evening to support later internal settlement cutoff times for banks. (one organization)
- The Federal Reserve should establish weekend electronic payments services to support weekend banking. (one organization)
- The Federal Reserve Banks should use their network to enable others to deliver images. (one organization)
- The financial industry should evaluate options for making deposit account information at banks (or similar accounts at other institutions) portable. (two organizations)
- The financial industry should expand the field for the dollar amount in the ACH message format to accommodate larger-value payments on the ACH. (one organization)

The following list includes all the staff studies published since November 1995. Single copies are available free of charge from Publications Fulfillment, Board of Governors of the Federal Reserve System, Washington, DC 20551. To be added to the mailing list or to obtain a list of earlier staff studies, please contact Publications Fulfillment.

168. *The Economics of the Private Equity Market*, by George W. Fenn, Nellie Liang, and Stephen Prowse. November 1995. 69 pp.
169. *Bank Mergers and Industrywide Structure, 1980–94*, by Stephen A. Rhoades. January 1996. 29 pp.
170. *The Cost of Implementing Consumer Financial Regulations: An Analysis of Experience with the Truth in Savings Act*, by Gregory Elliehausen and Barbara R. Lowrey. December 1997. 17 pp.
171. *The Cost of Bank Regulation: A Review of the Evidence*, by Gregory Elliehausen. April 1998. 35 pp.
172. *Using Subordinated Debt as an Instrument of Market Discipline*, by Federal Reserve System Study Group on Subordinated Notes and Debentures. December 1999. 69 pp.
173. *Improving Public Disclosure in Banking*, by Federal Reserve System Study Group on Disclosure. March 2000. 35 pp.
174. *Bank Mergers and Banking Structure in the United States, 1980–98*, by Stephen A. Rhoades. August 2000. 33 pp.
175. *The Future of Retail Electronic Payments Systems: Industry Interviews and Analysis*, by Federal Reserve Staff, for the Payments System Development Committee, Federal Reserve System. December 2002. 27 pp.

The staff members of the Board of Governors of the Federal Reserve System and of the Federal Reserve Banks undertake studies that cover a wide range of economic and financial subjects. From time to time, the studies that are of general interest are published in the Staff Studies series and summarized in the *Federal Reserve Bulletin*.

The following paper is summarized in the *Bulletin* for January 2003. The analyses and conclusions set forth are those of the authors and do not necessarily indicate concurrence by the Board of Governors, the Federal Reserve Banks, or members of their staffs.

