Two themes of the central banking seminar are directly relevant to consideration of payment system issues. One is the interdependencies of different functions normally performed by a central bank. In this regard, I know of no other aspect of the central bank's responsibility that requires more cooperation and coordination among the various central banking disciplines than the payment system does. A second theme is the role of the central bank in dealing with financial crises. Stress on a nation's payment system is often one of the earliest and most direct manifestations of financial crisis. Indeed, the payment system may be a direct channel through which liquidity and credit problems are transferred from one participant in the financial system to another. Such transfers have the potential to create systemic liquidity and credit problems that are of direct concern to the central bank. As a result, central banks are increasingly focusing on proper safeguards to allow payment system participants to control not only their risk, but also to prevent the contagion of systemic risk.

Because it has relevance for a range of central bank disciplines and functions and because it can become a focus of crisis management, the payment system does indeed deserve a prominent place in the thinking of central bankers. Yet, until the last decade or so, interest in payment system issues has been of secondary importance on the cen-

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central banking agenda. The payment system has traditionally been almost the exclusive province of central bank staff members with operations and automation responsibilities, reflecting the view that the payment system is essentially a mechanical process. Along these lines, the literature on the payment system has traditionally been slanted toward analyses of economic efficiency, with much of the literature framed in the context of the economics of the firm. The payment system has now entered the mainstream for central bankers, although, admittedly, the degree of interest varies from country to country.

This paper has three parts. First, to provide a common frame of reference, I develop a conceptual model of the payment system, with special reference to the essential role of the central bank. Second, I discuss the implications of the public policy and supervisory roles of the central bank in the payment system. These implications include (1) the need to establish public policies to guide the structure of newly developing private clearing and settlement arrangements, in terms of both their integrity and efficiency, and (2) the need for supervision of private clearing arrangements, not only domestically, but also for cross-border systems, in close cooperation with foreign central banks. Finally, I examine the role of the central bank as operator of the large-value, interbank payment mechanism. Special attention is given to the implications of the central bank’s role as a source of intra-day liquidity to the financial system and to the “safety net” attributes associated with access to the large-value transfer mechanism.

Model of the Payment System

In the simplest terms, the payment system is the apparatus through which obligations incurred as a result of economic activity are discharged through transfers of monetary value. The payment system is used mainly for simple day-to-day activities, such as retail transactions, that may be paid by using a very rudimentary, but nonetheless very effective, payment mechanism, such as cash. If the obligation is not discharged immediately (or in “real time” to use technical language) by using cash, then an alternative payment instrument, such as a paper or electronic credit or debit order, must be used. For payment

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\[\text{Although cash payments may appear rudimentary, they actually embody essential features that are sought in more sophisticated electronic payment mechanisms, including large-value funds transfer systems. When an obligation is discharged by using cash, and assuming there is confidence in the government issuing the cash, the payment and final settlement are simultaneous and immediate. Apart from the physical restrictions that make cash payments practical only for small-value transactions, much may be learned from the principles embodied in the use of this form of payment. See Goodfriend (1990).}\]
orders, the process of discharging the obligation can be divided conceptually into two parts. The first part is the clearing process in which payment information is conveyed from the payor to the payee, probably through intermediary banks. The second part is settlement in which the actual transfer of value associated with the payment order is made, generally not with cash but with a claim on a bank.

The payment system is also used to settle complex and large-value transactions, such as those arising from trading in financial instruments and their derivative products, and for other “commodities.” The markets for such instruments are very efficient: In some cases, assets are held for only a few hours or minutes. The size of individual transactions may also be very large: The average secondary market trade in U.S. Government securities, for example, is about $9 million. These markets therefore have rapid turnover of high-value transactions. Accordingly, while the model of clearing and settlement described here applies to large-value payments, the form the payment process takes has become rather specialized, often involving clearing organizations that ensure that payment in good funds is made against delivery for the contract in question (delivery-versus-payment systems) and that increasingly perform a multilateral netting of such contracts among those trading in the instruments to reduce the total value of individual deliveries and payments that must be completed.2

In this simple model of the payment process (Figure 1) economic activity gives rise to an obligation to perform on a contract. In many cases, the contract may specify the terms regarding the form of payment, including both timing and type of instrument used. As noted, discharge of an obligation using payment methods other than cash involves clearing the payment order, including the transfer, processing, and recording of payment instructions on the books of the institutions holding the accounts of the payor and the payee.

For most unspecialized transactions (right-hand side of Figure 1), each individual obligation is treated separately for purposes of clearing and settlement. When such obligations are handled and recorded individually, they are known as gross transactions, which receive gross settlement on the books of the settlement entity. Specialized transactions (left-hand side of Figure 1), which may include those for various classes of securities and equities and their derivative products, rely on traditional payment mechanisms for final settlement but increasingly involve the preliminary step of netting. Netting is a process in which gross obligations between two (bilateral) or more (multilateral) entities are settled by a single transfer of the net amount of funds or goods due

Trading in goods, services, and financial instruments results in the assumption of an obligation to perform on a contract (to supply or pay for goods, services, or financial instruments). The contract may include specific terms regarding the timing and form of payment.

Payment

Discharge of the Obligation

Cash or Specialized Payment order leading to Unspecialized the transfer of bank balances.

Clearing organizations and systems. Net settlement is increasingly used.

1. Clearing: Transfer and recording of the payment instruction (can be gross, i.e., transaction by transaction, or, if channelled through a specialized clearing organization, net).

2. Settlement: Actual transfer of value to a deposit account at a bank based on the payment instruction. Timing can be
   - Immediate
   - Same-day (end-of-day)
   - Next-day

Traditional payment instructions through the banking system (paper or electronic credit or debit transfers). Gross settlement is the norm.

Settlement involves the actual transfer of value based on payment instructions, whether gross or net, on the books of private banking institutions, through the use of bank balances, or on the books of the central bank. Commercial banks serve the primary role in the settlement step of the process. Banks are equipped to play the role of payment intermediary for two reasons. First, they hold the accounts of those engaged in economic activity. A second reason, often overlooked, is that banks can provide credit services to payors so that a
payor's obligation can be discharged even though it may not have the funds available when the payment is due. If the payor is a good credit risk and agrees to the bank's credit terms, then the bank will complete settlement by transferring value even if the payor is short of funds, thus greatly facilitating the payment process. In essence, banks provide the liquidity to allow the payment process to run smoothly. As intermediaries, banks aggregate payments due to and from each other and often settle payments through their own intermediary, that is, the central bank.

The volume and value of payment transactions in a modern economy with well-developed financial markets have reached the level at which central banks are increasingly relied upon to provide final settlement among banks. Central bank settlement can be immediate, occurring directly upon the processing of a credit payment order, or on the same day, involving a delay until the end of the banking day. As will be explained below, central banks may have a role in providing liquidity support to commercial banks by providing central bank credit either intra-day or at the end of the day, to ensure completion of payments on schedule. Such liquidity support should be consciously managed by the central bank because providing liquidity can easily get out of hand. Short-term "daylight loans" to banks by the central bank, if not repaid by the end of the day, become overnight loans. Thus, a direct connection exists between a central bank's decision to provide daylight credit and the management of its discount or Lombard facility.

Public Policy and Supervisory Roles of the Central Bank

Central banks, although their role in the payment system varies from country to country, have several common areas of concern regarding their countries' payment systems as broadly defined, including both clearing and settlement.

3Some markets and central banks still rely on "next-day" settlement, in which the transfers of value nominally occur on a given day but remain provisional—that is, they could be reversed—until some specified time the next day. Next-day settlement is particularly common in securities markets and is being addressed by the Group of Thirty recommendation to move all securities to same-day settlement.

4As it has in the United States, where daylight overdrafts on the books of the Federal Reserve banks now total about $70 billion for funds transfers and another $90 billion for book-entry securities transfers.
Execution of Monetary Policy

One area of concern involves the relation between the payment system and the execution of monetary policy. The result of the clearing and settlement process is that an economic actor obtains a bank deposit, which is one component of “money,” from another economic actor. The link between economic activity and money occurs via the clearing and settlement process, which in this manner can be seen as having a fundamental role in the execution of central bank policy. Accordingly, central banks should have a special concern about clearing and payment systems for broad reasons of monetary policy implementation.

Stability of the Financial System

Another common area of concern among central banks has to do with the stability of the financial system. This concern leads directly to an interest in the integrity of the payment system, that is, the ability of the payment system to function safely and efficiently even during times of financial stress. Such financial stress may be related to generalized market factors, such as wide swings in asset prices that create difficulty for the “losers” in trading to meet their obligations. Or, financial stress may be related to specific problems with a large participant in the payment system, either a nonfinancial corporation or a bank, to meet its own and, in the case of a bank, possibly its customers’ obligations.

As noted earlier, the payment system is one of the first places where financial stress can manifest itself—through the inability of payment system participants to meet their payment obligations. Serious problems involving one or several payment system participants, if contained, should not pose a threat to the safe and efficient functioning of the basic process. Such problems are properly the concern of the central bank in its bank supervisory role. Depending on the nature of the problem, however, financial stress suffered by one or more participants can translate into systemic problems that threaten the overall viability of the payment system. The celebrated case of the failure of

Examples of the effects that malfunctions in the clearing and settlement process, even if due to mundane operational problems, may have for financial markets and central bank policy are not hard to find. In August 1990, a power outage on Wall Street led to disruptions in money market operations, including Fedwire. The disruptions resulted in interest rate swings owing to the inability of banks to move balances efficiently. Similarly, in November 1985 an internal software problem at the Bank of New York involving the securities transfer application led that bank to incur massive daylight overdrafts with the Federal Reserve and an overnight discount window loan of $23 billion.
Bankhaus Herstatt in 1974, for example, illustrates how just one institution's inability to discharge its payment obligations (in this case payment of dollars against deutsche mark in foreign exchange transactions) can seriously affect the positions of other payment system participants. When the financial problems of one or several participants threaten the viability of the entire process, the possibility of systemic risk to the payment system becomes real.

Efficient Operation of the Payment System

The efficient operation of the payment system is another legitimate concern of the central bank and is important on at least two counts. First, the proper handling of payments is a resource-consuming activity that deserves attention on purely economic grounds. In the United States, for example, the annual cost of operating the domestic payment system is estimated at about $60 billion. If the payment process involves substantial participation by the private sector, then we should have confidence that market forces will tend to enhance the efficient operation of the payment system. The introduction of newer technologies with high fixed investment costs, however, may entail some element of increasing returns to scale in the payment-processing aspects of clearing and settlement. To the extent that returns to scale are increasing, the payment process may assume natural monopoly characteristics. In the natural monopoly case, the central bank needs to be knowledgeable about payment-processing operations and the behavior of the natural monopolist that operates the system, including the fees charged and the fairness of the terms of access to the payment infrastructure.

The second reason for the central bank's concern about the efficiency of the payment system is that the functioning of the payment system has implications for the efficiency of the underlying markets that it supports. Some of these markets, such as those for certain

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6The 1974 Herstatt case has given rise to the term "Herstatt risk," which describes the temporal dimension of the credit risk assumed by the counterparty in a foreign exchange deal when payment of one currency becomes final some time before the payment of the second currency is completed. Herstatt risk arises in part because the operating schedules of national payment systems are not synchronized. In addition, there is no mechanism today that offers the benefits of concurrence that could be derived from a delivery-versus-payment mechanism. In the case of the U.S. dollar, final settlement of roughly $425 billion in daily foreign exchange is delayed up to fourteen hours (for deals originated in the Far East) until the final settlement of Clearing House Interbank Payment System (CHIPS) transfers on the books of the Federal Reserve Bank of New York at about 5:30 p.m. eastern time in the United States.

7This estimate does not include any imputed cost associated with the risks assumed by banks (including the central bank) in granting credit as part of the payment process. See Humphrey and Berger (1990).
Clearing and Payment Systems

financial instruments, are worldwide. The location of the nucleus of activity for these markets may depend at least in part on the integrity and efficiency of the clearing and settlement process in different countries. Thus, countries that wish to play a role as financial centers must be concerned about the efficient operation of their payment systems.

Central Bank Payment System Operations

The actual operation of payment systems by central banks encompasses a broad range of experience. At one end of the spectrum is the example of the United States, where the Federal Reserve, through the twelve Federal Reserve banks, has been an active operator of both paper and electronic payment mechanisms since the passage of the Federal Reserve Act in 1913. It is estimated that the Federal Reserve handles one third of all checks cleared in the United States and the majority of automated clearing house (ACH) transactions (the ACH is a paperless, small-value, debit-and-credit transfer system). Moreover, the Federal Reserve handles about half of large-value funds transfers and all book-entry securities transfers of U.S. Government and certain agency securities over Fedwire. Since the passage of the Monetary Control Act of 1980, the Federal Reserve has established explicit fees for providing payment services. The Federal Reserve recovers the full costs of these services, including the imputed costs of capital, debt, and taxes a private firm would incur. Federal Reserve payment services are offered in direct competition with the private sector. Revenues generated from providing payment services now total nearly $800 million annually.

The Federal Reserve's dual role of competitor in and regulator of the payment system has been a difficult and almost chronically controversial one. The Congress of the United States mandated a very active operational role for the Federal Reserve in the payment system because of conditions arising from the fractionalized U.S. banking structure, in which true nationwide banking does not exist even today, and because of the geographic size and diversity of the nation. The geography and legal environment in the United States probably create a unique set of conditions. The conditions that influence the extent a central bank's involvement in payment system operations can change with time, however, so that the operating role of the central bank should not necessarily be taken as a constant, but rather as a matter of policy choice influenced by environmental factors.8

*See Johnson (1990).
Conditions other than geography and banking structure, however, may lead a central bank to play a significant operating role in a nation's payment system. For example, in some nations, such as France, the central bank plays a major operational role in the payment system on behalf of the banking system. In this model, which is probably influenced by economies of scale and national preferences regarding the degree of direct governmental involvement in management of national "utilities," the central bank is the logical entity to provide the payment infrastructure.

At the other end of the spectrum, some central banks play a very minor role in the operation of their nation's payment systems. In Canada and the United Kingdom, for example, payment processing is largely carried out by private enterprises and is governed by a ruling body composed of representatives of the financial services sector. The central bank, while not directly involved in the operations of the payment system, typically plays a coordinating role in governing these arrangements and, under certain terms and conditions, may make its books available for the settlement of payment transactions.

My purely personal point of view, which is conditioned by more than a decade of involvement in the payment system, both as a practitioner and as a policy advisor, is that the benefits of placing operations in the hands of the private sector should not be underestimated. Indeed, in virtually every other market for goods and services, the benefits of competition in ensuring a continuous high standard of performance are best attained through a free market approach. Assuming for the moment that principles governing the safe operation of the payment process are clearly laid out and adequately supervised by the central bank, then, all other things equal, the process should generally work best when ruled by competitive forces in a market environment.

I say "generally" because of the notable exception of the large-value payment mechanism that provides immediate settlement on the books of the central bank. This payment mechanism may be considered an instrument of financial policy and therefore is best controlled by the central bank. It is virtually impossible for the private sector to provide the degree of safety and liquidity for the transfer of money balances that can be provided by the central bank. Interbank systems for the transfer of large amounts of funds are discussed below.

Supervision of Private Clearing and Settlement Systems

The central bank's involvement in establishing principles for, and, when necessary, in supervising and regulating private clearing and
settlement arrangements that support large-value transactions, is especially critical. I will not recount here the financial, structural, and operational features that should characterize these systems and in which the central bank must have an essential interest. Most important, however, are features that commit the private participants in the specialized clearing systems, especially multilateral clearing arrangements, to provide guarantees for the final settlement of the net positions that arise from the clearing. Such guarantees must be founded upon carefully constructed entrance criteria for participation in the arrangements. Moreover, members of such clearing arrangements must have the incentives and capabilities to make their own credit judgments about the parties with whom they will do business. In addition, concrete commitments are needed in the form of loss-sharing arrangements backed by either collateral or lines of credit to ensure the liquidity and resources to guarantee settlement in the event of default by one or more participants.

A good deal of analysis is taking place in the United States at the Federal Reserve and in the private sector to refine the principles that should govern private large-value transfer systems, including delivery-versus-payment systems. Recently, the Federal Reserve has given regulatory approval for the operation of private clearing arrangements for U.S. Government securities (Government Securities Clearing Corporation) and for mortgage-backed securities (Participants Trust Company). An arrangement for converting from paper to book-entry form clearing and settling commercial paper transactions has been started by the Depository Trust Company. Finally, the members of the Clearing House Interbank Payment System (CHIPS) have adopted a system of settlement guarantees for that large-value funds transfer system.

The principles underlying the proper operation of private clearing and settlement arrangements are universal. Indeed, the central banks of the Group of Ten (G-10) countries have recently adopted international minimum standards to guide the operation of cross-border and multicurrency interbank netting and clearing arrangements. The central banks of the Group of Ten have also recognized the need to oversee the operation of significant interbank netting arrangements and have established principles for cooperation among themselves when such arrangements operate across borders.

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9For an excellent review of these features, see the May 1988 address given by E. Gerald Corrigan at the Williamsburg payments symposium sponsored by the Federal Reserve Bank of Richmond. See Corrigan (1990).

Clearly, a component of the financial system as important as the payment system should not go unsupervised. Active involvement by the central bank in developing the principles under which private clearing arrangements operate is the most important role in supervision of the payment system.

An important method for ensuring compliance with sound payment system principles is the regular commercial bank examination process, in which central banks or other governmental authorities conduct safety and soundness inspections of individual banks. A bank's participation in a private clearing arrangement can be scrutinized as part of the commercial bank examination process and effective influence can be applied to the clearing arrangement through the examination of the institutions that use it. In addition, the proper application of these principles can be accomplished through supervision of the privately operated clearing organizations that adopt these principles for the processing of specialized payment transactions, as described in Figure 1. Although central bank settlement of transactions processed through private clearing organizations provides a vehicle to ensure that such arrangements employ sound principles, the sole sanction of refusing to settle may be disruptive for established systems. Consequently, more flexible supervisory tools available to the central bank are desirable. Such supervisory tools involving clearing organizations might include review and approval authority over the rules of clearing organizations, rule-writing authority, and cease-and-desist powers to address in a timely manner serious problems that have implications for the safe and sound operation of the payments system.

Finally, in an interdependent world where goods, services, and financial instruments are traded routinely across national borders, the need for international payment mechanisms is increasing dramatically. Such cross-border systems may operate in many countries and time zones, thus presenting central banks with a variety of challenges that can only be met through cooperation in the development and execution of payment policy. The international payment system, therefore, should be a focus of our attention in the years ahead, as reflected in the recent actions of the central banks of the Group of Ten to adopt minimum standards to guide the operation of cross-border interbank netting and clearing arrangements, along with principles of cooperation among the central banks themselves for overseeing such arrangements.
Role of the Central Bank as Operator of Large-Value Payment Mechanisms

Another aspect of the role of the central bank in the payment system is, I believe, becoming increasingly important, if not essential. This role involves the operation of a large-value, real-time funds transfer mechanism to handle final settlement transfers on the books of the central bank.

Efficient financial markets are a perquisite to the development of modern financial systems. As noted earlier, the financial system is today characterized by high volumes of large-value transfers occurring each day. Experience has shown (for example, the Herstatt case and, more recently, the failure of Drexel, Burnham, Lambert, Inc.) that the payment system is best insulated from shocks that may have systemic risk consequences, such as the inability of one or more large participants to meet their payment obligations, by minimizing temporal risk and establishing private settlement guarantees to maintain confidence in the system. There is no surer way to provide finality and certainty of actual settlement than through the irrevocable transfer of value on the books of the central bank.

A large-value credit transfer mechanism run by the central bank can be flexible enough to support many types of payments, including net settlement transfers generated by specialized clearing organizations. Further, the transfer of value can occur through central bank operation of a delivery-versus-payment system for a subset of financial instruments, for example, government securities, in which gross transfers are settled as they occur. Or, the central bank can offer its real-time funds transfer capabilities to private book-entry settlement systems to settle the net positions of participants in these systems.

In summary, the availability of a final settlement vehicle that minimizes, to the theoretical limit of eliminating, the time delay between the initiation of a payment instruction and its final settlement is becoming more and more important. There is, in my view, no substitute for a central bank's playing the key role governing, if not operating, such a mechanism. Yet, caution must be exercised lest a central bank become the primary source of the intra-day liquidity needed for a smoothly functioning payment process. Along these lines, a relevant case study is our experience in the United States with daylight overdrafts on the books of the central bank occurring as a result of the operation of a large-value funds transfer mechanism.

As noted earlier, the practice of providing intra-day credit as part of the payment process is now recognized as a core banking function. In
the United States, the Federal Reserve provides a huge amount of daylight liquidity to the U.S. payment system. Nearly 40 percent of these daylight overdrafts are incurred by the ten largest overdrafters, while approximately three fourths are incurred by the fifty largest overdrafters. There is also a private sector source of intra-day credit through CHIPS, with controls in place since October 1990 to help ensure timely end-of-day settlement should a participant with a large intra-day net debit position be unable to cover its obligations by the close of business.

Daylight credit is roughly analogous to the short-term working capital requirements of firms whose intra-day patterns of receipts may not exactly match their patterns of expenditure. A large, complex, market-oriented economy could not function effectively without a certain amount of intra-day liquidity to fund the gaps that result from the difficulty associated with synchronizing the timing of high volumes of payment transactions. In the United States, the central bank currently provides this liquidity at no explicit cost. In Switzerland, in contrast, the central bank does not permit overdrafts, and banks have managed to conduct their business without an intra-day market. Yet again, in Japan the central bank provides no intra-day liquidity, but a private market for daylight (morning and afternoon) credit has emerged.

Daylight credit is a valuable commodity. Extensions of daylight credit, however, have the economic cost of exposing the lender to default risk. For the central bank, a direct connection exists between the extension of intra-day credit and discount window or Lombard credit, because a borrower's inability to repay its daylight loan puts the central bank in the position of having to consider converting the loan to an overnight credit.

If something has value but is not priced, then it tends to be overused and wasted. The current high level of daylight overdrafts in the United States and the resulting exposure of the Federal Reserve to default risk suggest that intra-day credit is now being overused in the United States. Accordingly, the Board of Governors proposed in June 1989, and expects to implement once a scheme for measuring daylight overdrafts is adopted, an explicit fee be charged for the use of daylight credit extended by the Federal Reserve banks. The rationale for pricing daylight overdrafts is twofold. First, the Federal Reserve strongly favors market solutions to resource allocation problems. Second, we believe that the significant amount of daylight credit currently supplied should be controlled and reduced, without, however, disrupting the payment system. Charging a relatively low fee should permit users of payment services to make the necessary adjustments to reduce grad-
ually the amount of daylight overdrafts they incur while avoiding abrupt changes in the supply of daylight credit.\textsuperscript{11}

From a historical perspective, it seems clear to me that the Federal Reserve had no intention whatsoever of providing large amounts of daylight credit, priced or otherwise, when it began offering funds transfer services early in its history. The origins of the present day Fedwire system date to 1918, and the early designers and operators of the early system could not have anticipated the significant increase in the value and velocity of payments. In fact, it was not until the 1970s that the increase in the volume of funds transfers resulted in the rapid intra-day turnover of reserve balances, leading to material extensions of intra-day credit. Accordingly, I think it unlikely that the Federal Reserve would have positioned itself as a large provider of daylight credit had the nature of the modern day phenomenon been better understood when Fedwire was designed.

Consideration of the role of the central bank as the operator of a large-value funds transfer system leads naturally to the question of the “safety net” attributes of this role. Access to the payment system through clearing and settlement services provided by the central bank, including perhaps central bank credit, is one component of the safety net that central banks and governments place under their financial systems. In many countries, various implicit and explicit forms of deposit insurance designed to ensure public confidence in depository institutions and the safety of their deposits is also a component. Of course, the most essential component of the safety net is the emergency liquidity assistance that is available through the central bank.

Like any other part of the safety net, access to the payment system must be judiciously managed to ensure that it is not abused. Used properly, however, and in combination with the central bank’s supervisory and regulatory oversight of the banking system, access to the payment system can be a useful regulatory tool in ensuring that depository institutions do not fail prematurely.\textsuperscript{12} In essence, the central bank gives financial system participants confidence that the payments they may receive from a troubled institution are good value. With this confidence, they will be willing to continue to deal with that troubled institution, thus providing the time the bank regulatory authorities need to work out an orderly solution to the problem. Without such

\textsuperscript{11}The Federal Reserve Board has proposed phasing in a charge of 25 basis points at an annual rate for daily average daylight overdrafts as an appropriate starting point for daylight overdraft pricing.

\textsuperscript{12}See Board of Governors of the Federal Reserve System (1990).
confidence, a troubled institution, by being frozen out of the payment system, would be isolated and doomed to immediate failure.

Summary

The payment system is now recognized as an essential component of a smoothly operating market economy supported by an efficient and complex financial system. The central bank has a proper role (1) in establishing public policy to govern the structure of clearing and settlement arrangements in the payment system; (2) in supervising the payment system through the clearing organizations and banking institutions that play key roles in risk management; (3) in providing settlement across its books; and (4) in operating large-value payment mechanisms. Much is to be gained by permitting private entities to compete in the provision of payment services to the public. Because of the critical nature and “safety net” attributes of large-value payment mechanisms, however, operation of such a mechanism, alone or in parallel with similar privately operated mechanisms, is properly a role of the central bank. Central banks must take care in controlling the intra-day liquidity they provide to the financial system and the payment system risk they absorb.

Bibliography


