



Payment System Reforms and Monetary Policy

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The design of payment systems has important implications for the conduct of monetary policy, the soundness of financial firms, and the functioning of the economy as a whole.

THE TERM “payment system” refers to the instruments, organizations, operating procedures, and information and communications systems used to initiate and transmit payment infor-

mation from payer to payee and to settle payments—that is, transfers of money. The design of those systems critically affects the efficiency with which monetary policy is conducted, the soundness of financial institutions, and the functioning of the economy as a whole. The globalization of financial markets and the progress toward market-based monetary and exchange arrangements have strengthened such linkages and made them even more apparent. As a result, payment system reforms have figured prominently in many programs of financial sector reforms (for example, Italy, 1989/90; Malaysia, 1986/89; and Thailand, 1995). All economies in transition have been implementing major reforms of payment systems in order to expe-

dite the processing of payments, reduce the risk and uncertainty associated with noncash payments, facilitate adoption of indirect instruments of monetary policy, and foster financial market development. Harmonization of payment system arrangements has been a key technical reform in the progress toward a single monetary policy in the European Monetary Union.

Payment system reform

Instruments and systems. Payment instruments take many forms, such as cash, checks, traveler’s checks, money orders, debit and credit cards, wire transfers, automated clearinghouse transfers, and point-of-sale and automated teller machines. There are a number

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of desirable qualities of payment instruments, of which the most important is liquidity, which relates especially to general acceptability and marketability, with little or no risk of capital loss. Policies to increase the diversity and liquidity of payment instruments are a major focus of payment system reform.

In a modern market economy, specialized systems have evolved—driven by users' changing needs, competition among banks, and changing technologies—to deal with various instruments and transactions. Most modern market economies have one or more clearinghouses. These are associations of banks to exchange payment documents and settle payments—usually after the netting of credits and debits is done, according to certain rules. Small-value (retail) payments are typically processed through such clearinghouses.

Most modern market economies either have or are developing large-value transfer systems (LVTs), which clear and settle time-critical payments, particularly large ones that require a high degree of security and reliability, such as those generally associated with money market and securities operations.

One of the main differences between funds transfer systems, particularly LVTs, is whether interbank settlement takes place on a net or a gross basis. In a net settlement system, running balances are calculated on a bilateral and multilateral basis for each participant vis-à-vis the other participants, and only the net amounts are settled at the end of the clearing cycle. Unless controls exist during the clearing period, there is a risk that participants having net obligations at the end of the clearing cycle—which typically takes a day—will be unable to settle them. Participants' positions will be unpredictable to the extent that banks cannot precisely forecast the payments made by their customers or the payments coming into their accounts. Moreover, until the net obligations have been settled at the end of the day, all other payments are provisional.

With gross settlement, payments are settled one by one, typically in real time—that is, with virtually no delay. When interbank settlements are made through the central bank, then payments can be final and irrevocable. Since payments are not netted out, however, gross settlement systems need larger amounts of intraday reserves to facilitate prompt settlement of payments.

Payment systems can be assessed in terms of their risks, reliability, and transaction costs. Financial risks are clearly important. Risks related to inadequate legislation, human error,

equipment failures, or poor security may also be important, in that they reflect the reliability of payment systems and the transaction costs involved.

To increase the reliability of the payment system is to increase the certainty of operations and the predictability of their quality. Reliability can be enhanced by, among other things: (i) norms and standards (for such things as documents, terminology, and hours of operation); (ii) contingency plans (especially for equipment breakdowns); and (iii) technological innovations.

Transaction costs involve costs for such things as information, processing, negotiation and bargaining, transfer of information and

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documents, monitoring, and enforcement. Cost reduction typically requires institutional and organizational changes, and technological innovations.

Payment systems face three types of financial risk. Liquidity risk is the probability that timely settlement of a payment will not occur because the debtor has insufficient funds. Credit risk is the probability that a payment will not be fully settled because the debtor becomes insolvent. Systemic risk is the probability that settlement failure of one or more participants in the payment system will lead to liquidity or solvency problems for other participants, causing widespread settlement failures.

Risk management. In funds transfer, measures have been adopted, especially since the early 1980s, to address financial risk management in payment systems, particularly LVTs. These measures aim not only at reducing the risks faced by individual payment system participants but also, and more important, at minimizing systemic risk. They can be divided into four types, namely (i) exposure limits, (ii) collateralization, (iii) loss-sharing arrangements, and (iv) shortening of time lags in settlements.

Collateralization and loss-sharing arrangements often involve network participants posting collateral to facilitate settlement in

case of settlement failure by a participant. Typically, highly liquid assets such as government securities will be used as collateral, with such assets held in a network account at a securities depository (for example, at the central bank).

In the absence of adequate loss-sharing arrangements, payment networks can provide for partial unwinds or total unwinds. A partial unwind occurs when a failed participant's obligations are deleted from the network's accounts and the settlement calculations are redone. A total unwind occurs when settlement is canceled for the transaction period and all transactions have to be redone, as desired by participants, under the new circumstances.

Unwind solutions have become increasingly unpopular because they can cause systemic disruptions.

Reducing time lags in settlement can greatly reduce financial risks by reducing the risk that a debtor might fail. All major (and especially large-value) interbank funds transfer networks either have or plan to have same-day settlement. Central banks are, more and more, opting for real-time gross settlement when building their own systems. Since settlement takes place transaction by transaction, exposure time becomes virtually zero. Progress in information technology has made these systems easier and less costly to build and operate.

Organizational aspects of reform. Many countries have found it useful to establish some kind of national payments council, comprising the central bank, the commercial banks, and probably other financial organizations that actively participate in the payment system. Within such a coordinating body, ideas can be openly discussed, information on the demand for payment services obtained, and consensus reached on important technical and public policy issues.

Given the growing worldwide integration of financial markets, the reforms undertaken by any single country may not fully achieve their objectives in the absence of international coordination. Without coordination, financial firms could face different institutional and regulatory environments in the various countries where they operate. Some firms could actively search for regulatory loopholes or more benign regulations, which would increase risks and reduce reliability for all firms. The transaction costs associated with the payment system for any one country will be much higher also if product specifications, business hours, finality rules, and bankruptcy laws are not standardized; cross-border transacting will require additional resources to achieve



conformity with the requirements of different institutional environments.

Role of central bank. The central bank has an important public interest role in the payment system. This normally involves its playing an active part in (i) establishing a legal framework to ensure appropriate institutions, organizational structure, and monetary policy environment; (ii) facilitating payments finality; (iii) regulating private agents in the payment system; (iv) administering, as owner/operator, various payment services; and (v) providing credit for participants in the payment system, especially in LVTSSs.

Payment is final when it becomes irrevocable and unconditional. Payments made using central bank money are final because the central bank can neither fail nor face liquidity problems. The regulatory powers of the central bank often include (i) requiring that certain clearing organizations and interbank large-value (net) settlement systems settle accounts with the central bank and have in place appropriate risk-management measures to ensure payments finality without central bank intervention, and (ii) licensing and reporting requirements for engaging in certain activities in the payment system.

The central bank's role as a supplier of payment services varies from one country to another. At one extreme, it can be limited to providing settlement services for a few major banks. At the other, the central bank is, in addition, involved in processing payment documents, running clearinghouses, and owning and operating LVTSSs. Many central banks regard a reliable real-time gross settlement system as an important prerequisite for the effective implementation of monetary policy and the efficient functioning of financial markets.

The central bank could provide credit facilities as part of its payment services, especially in connection with an LVTSS, to facilitate a smooth flow of settlements in the payment system. But the central bank will not want these credit operations to reduce its control over liquidity (and monetary) management. It will also want to avoid becoming the lender of first resort for market participants. On the contrary, it would want to foster the development of private money markets, including those for intraday funds. Moreover, in grant-

ing credit, a central bank will typically wish to use both prices and uniform and objective rationing criteria comprising (i) observance of regulatory and supervisory norms, (ii) provision of collateral, and (iii) requirements for borrowers' capital.

Important linkages

The instruments and operations of monetary management, the institutional arrangements for money markets, and aspects of the

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payment systems are closely linked. These linkages become most evident during a country's transition from direct controls on interest rates and credit to indirect monetary management—that is, the management of bank reserves using market-based instruments. Payment systems affect the demand for, and supply of, bank reserves. The interbank market for settlement balances is a component of the money market, whose features are themselves strongly influenced by both payment system design and the monetary operations framework. Together with banking supervision, well-designed payment system policies help countries avoid major disruptions to monetary stability.

In the light of these linkages, many countries have reformed their monetary operations, money market arrangements, and payment systems in a mutually reinforcing and coordinated fashion. For example, the Bank of Italy introduced major reforms of clearing and settlement arrangements in 1989. This was complemented in 1990 by the introduction of a screen-based interbank money market, reforms of the reserve requirement system, and changes in operating targets. Bank Negara Malaysia introduced a same-day settlement system in 1986 and supported it by reforming reserve and liquid-asset require-

ments and introducing an interbank lending facility for overnight funds. In 1989, it introduced a real-time gross settlement system for payments and reformed the market for government securities. In Thailand, a real-time gross settlement system for interbank transfers has been in place since May 1995, together with reforms of the clearing system. Complementary reforms of money market and monetary operations are being implemented. Broadly speaking, the type and pace of payment system reforms have reflected the initial conditions in the payment system and the overall pace of financial liberalization.

Reforms in risk management will change the size of float, the demand for reserves by commercial banks, and the probability of central bank intervention to prevent the spread of crises. The architecture of the interbank settlement system and the demand for reserves interact to influence the nature of instruments available in the money markets and the volatility of the market rate for bank reserves, hence influencing the transmission mechanism for monetary policy. The demand for both reserves and money market instruments is influenced by whether certain interbank money market transactions are settled immediately, at the end of the day, or with a lag, and by whether timely information on account positions is available to the participants.

Reforms of accounting systems undertaken to facilitate interbank settlements typically lead to a large decrease in demand for reserves and an increase in the demand for money market instruments. Similarly, prudential reforms that limit interbank exposures and the introduction of an efficient interbank gross settlement facility using central bank funds will affect the demand for reserves while reducing systemic risks. Moreover, reforms of accounting and payment processing rules that change the timing of debits and credits will also reduce the size and variability of float (that is, amounts debited but not yet credited—or vice versa—in the course of completing a payment transaction).

Finally, the introduction of new payment instruments or changes in the relative attractiveness of different instruments might change the size and variability of bank reserves and, consequently, the stability of relationships between money and other economic variables.



The effects of payment system changes on the demand for money, the money supply, and the transmission mechanism of monetary policy are typically gradual, though their magnitudes are not always predictable. However, countries considering making large, one-time changes in payment system arrangements should pay close attention to the specific linkages between payment systems and monetary policy, and therefore undertake coordinated reforms of payment systems, monetary operations, and money market arrangements.

Countries in transition

Reforms of payment systems have had to be particularly comprehensive in countries making the transition from centrally planned to market economies. The experience of four of these countries—Bulgaria, Czechoslovakia, Poland, and Russia—illustrates this point.

Originally, in those countries—as in other centrally planned economies—the payment system strictly separated the cash and non-cash circuits: households used cash while payments between enterprises were made through bank accounts. Moreover, they had only a single organization—the state-owned monobank—that performed both central and commercial banking functions. The payment order (a credit instrument) and the payment demand order (a debit instrument) were the main noncash payment instruments. Except for Czechoslovakia, payment clearing involved the physical transport of paper documents. Settlement was carried out on a gross basis, with detailed verification and reconciliation procedures.

The shift from monobanking to two-tier banking and subsequent banking reforms led to sharp modifications in these arrangements. They required the authorities to distinguish between interbank and intrabank settlements, define the role of the central bank in the payment system, and establish appropriate accounting structures and policies toward banks and organizational arrangements to address interdisciplinary issues and to build consensus among users. Risk and the opportunity cost of funds (that is, the cost of uninvested funds) were new concepts that had to be built into the payment systems. In Russia, the existence of 11 different time zones was an additional complication.

The creation of commercial bank accounts with the central bank was a key step in the transformation of centrally planned economies into market economies. In

Czechoslovakia, the initial transformation of the monobank system in 1990 into a two-tier system provided for both the commercial banks and the central bank to settle their interbank transactions through accounts with two commercial banks. That arrangement, which deprived the central bank of control over total bank reserves, was replaced a year later by a system of settlement through the central bank.

A large and variable float was a major problem in the transformation of centrally planned economies' payment systems. In all these countries, variations in net float were a major source of change in reserve money. In Poland, they initially created a serious credit risk and opportunities for fraud, one instance of which (in 1991) had a large impact on reserve money. In some countries, such as Bulgaria and Russia, central banks initially allowed the processing of payments even if that entailed granting an automatic overdraft to the payer's bank, which seriously weakened the central bank's grip on monetary policy.

The central bank of Russia also had to deal with a host of problems created by its branches in other republics of the former Soviet Union becoming independent central banks while still sharing a common currency, the ruble. This initially led to the branches of the central bank of Russia granting automatic credits to the central banks of the other newly independent countries, which further compromised Russia's ability to implement monetary policy.

Convinced of the importance of these problems, the authorities and market participants made strong efforts to improve the payment systems in these four countries. In 1991, Czechoslovakia not only arranged for interbank settlements to be carried out through the central bank but also modernized its settlement center, introducing new technology; later, adjustments were made to cope with the split-up of the country in 1993 and the subsequent introduction of separate currencies. In 1992, Bulgaria introduced an electronic queuing facility to reduce float and eliminate automatic central bank overdrafts. In a process that started in 1991, Poland's central bank consolidated banks' clearing accounts into a single account, tightened regulations to reduce payment system risks, and helped to set up a national clearinghouse.

In Russia, the central bank established special courier services between its main cash settlement centers, reorganized its computer centers, and upgraded the technology used in its payment system. It also reduced settlement

delays in Moscow to the next day for most payment transactions and to three days for the remainder. Tighter security measures helped to address the problems with fraud that had plagued the system in 1992. In 1992, the central bank eliminated the use of payment demand orders (orders for payment initiated by the payees), which had helped create large interenterprise arrears. Commercial banks have also taken several initiatives, the main ones being the accelerated development of extensive correspondent banking relationships and steps to set up clearinghouses.

The reform measures adopted in the four countries discussed succeeded in substantially improving the functioning of their payment systems. This allowed for a rapid development of their money and interbank markets, as well as of their foreign exchange markets. It also made it possible for the central banks to move from direct controls to indirect methods of monetary management. A measure of the reforms' success is the reduction in the amount of excess reserves that banks maintained.

Despite the progress already attained, the process of reforming payment systems in these transition economies is far from complete. Much remains to be done in some countries to bring their systems up to the standards required in a modern market economy. For instance, a key pending task in Russia is establishing a system that allows the rapid and safe processing of large-value payments. More broadly, these country experiences have provided further confirmation of the fact that market needs and monetary policy considerations, not technology per se, must be the driving forces of payment system reform. **[F&D]**

Suggestions for further reading:

Tomás J.T. Baliño, Juhi Dhawan, and V. Sundararajan, 1994, "Payments Systems Reforms and Monetary Policy in Emerging Market Economies in Central and Eastern Europe," IMF Staff Papers, Vol. 41 (September), pp. 383–410.

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