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Modernizing Payment Systems in Emerging Economies

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An overview of payment systems in developing countries and transitional formerly socialist economies, designed to raise awareness of the challenges faced by central and commercial banks and by the World Bank in developing or modernizing payment systems.

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Summary findings

Listfield and Montes-Negret address the following questions in this overview of payment systems: What is a payment system? How can efficient systems contribute to the development of modern, market-based financial institutions and markets? What elements are necessary for payment systems to operate efficiently? What are the operational characteristics of a modern payment system? What is the central bank's role? What problems do countries face when developing payment systems? What is the World Bank approach to selected payment system initiatives, design, and development?

Effective, efficient payment systems, they conclude, are vital for the economic development of emerging economies. Efficient payment systems help promote the development of commerce, enhance economic policy oversight, control the risk inherent in moving large values, and reduce the financial, capital, and human resources devoted to the transfer of payments.

Many emerging economies lack the financial and technical resources to develop such systems. Many turn to the World Bank and other international agencies for assistance. Unfortunately, some believe that the entire solution for an effective payment system rests in obtaining modern computer hardware and believe the World Bank's sole contribution is to finance hardware

costs. Hardware procurement alone will not solve problems of payment systems.

These countries need organizational plans and structures for national payment systems before they spend money on computer equipment. They often lack the expertise to design and operate modern payment systems, so they may need technical assistance from financial experts before they invest in systems development.

The design of a new payment system should be kept simple. Many emerging economies lack the infrastructure and banking sophistication to leapfrog from basic to state-of-the-art payment systems. The first task is to fix the most serious problems. The second is to upgrade the current systems incrementally, to meet basic standards of timeliness, security, and reliability. As these improvements are made, the countries can turn their attention to long-term, advanced solutions.

Each country's payment system is unique. To simply import another country's system without adjusting for the target country's geography, infrastructure, banking and legal structures, culture, and needs could lead to suboptimal solutions. Development of the system should follow a disciplined plan for defining the needs of users and for organizing the project team and project goals.

This paper — a product of the Financial Sector Development Department — is part of a larger effort in the department to examine factors constraining the development of countries' financial infrastructure. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Fernando Montes-Negret, room G8-133, extension 37832 (43 pages). August 1994.

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MODERNIZING PAYMENT SYSTEMS IN EMERGING ECONOMIES

by

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This paper presents an overview of payment systems in developing countries and transitional socialist economies. The paper does not intend to make the reader an expert in payment systems. The paper intends to raise awareness of the challenges faced by central and commercial banks and the World Bank in developing or modernizing payment systems. The paper addresses the following questions:

1. What is a payment system?
2. What contributions can efficient payment systems make to the development of modern, market-based financial institutions and markets?
3. What elements are necessary for payment systems to operate efficiently?
4. What are the operational characteristics of a modern payment system?
5. What is the Central Bank's role?
6. What problems do countries face when developing payment systems?
7. What is the World Bank approach to selected payment system initiatives and design and implementation?

1. What is a payment system?

A payment system is actually quite simple: it defines the procedures, rules, standards and instruments used to exchange financial value between two parties discharging an obligation. Although the purpose is simple, payment systems evolve over a period of years. The different conditions in each country (size, legal systems, business practices, communications, infrastructure, stages of development of instruments and institutions) make each payment system unique. Therefore, it is impossible to use one country's payment system as the sole model to be copied in emerging countries.

Emerging economies (former socialist republics or FSRs) do not have to "re-invent the wheel" to develop their own payment systems. They can adapt successful systems and practices from more developed countries to suit their own needs. Emerging countries can learn from the mistakes made in other countries and avoid them by introducing preventive measures early in the development process. What are the key attributes of a successful payment system?

Payment transactions have two parts-- the flow of information providing payment instructions and the flow of funds. These two flows are always related, but may follow different paths and have different timings. Each payment transaction has four common elements: an obligation to discharge; a party to make the payment (payer) and a party to receive the payment (payee); a payment instrument, such as cash or a check, to convey the information about the transactions; and one or more financial intermediaries (usually banks) to transfer the value by drawing funds from the payer's account depositing funds into the payee's account. Sometimes a third party (the central bank or a settlement bank) facilitates exchanges of value between the two participants banks. Each transaction has different requirements depending upon the customers (consumers or businesses), the nature of the financial obligation (bill payment or purchase at the point of sale) and the speed, security and cost required for the transaction. Developed countries (and many emerging ones) use several different payment instruments

and processing systems to satisfy the country's payment system needs.

Since either party in a transaction can be the payee or the payer, payment types are usually depicted by the following matrix:

<i>Payee/Payer</i>	<i>Consumer</i>	<i>Business</i>	<i>Government</i>	<i>Financial Institutions</i>
<i>Consumer</i>				
<i>Business</i>				
<i>Government</i>				
<i>Financial Institution</i>				

Payment Instruments

Each payment transaction requires some form of payment instrument to supply the term and conditions for the transaction. Each payment instrument must meet physical, legal and regulatory standards. Some of the principal payment instruments are described below.

Cash is the simplest example of a payment instrument. Cash is still used for most payment transactions (in number, not in value) in developed countries. The physical standards to protect cash from forgery vary by country and might have the following features: unique size and color, denomination, special paper and security features (ink, watermark, security thread, latent image, microtext, see-through features, silver-lustrous surface, protective line structures). The legal and regulatory standards include backing from the government, convertibility into other currencies and transferability to other parties. Because cash is transferable at full face value (within its country of issue), it discharges an obligation between two parties without further action.

Non-cash payments require the use of one or more banks to complete a transaction. Non-cash payments are not accomplished merely by exchanging the payment instrument between payer and payee, but by transferring deposit money between the payer's bank and the payee's bank.^{2/} Non-cash payment instruments provide the mechanism for this bank-to-bank transfer.^{3/} Non-cash payment instruments, such as checks, must specify the payment amount, the names of the payer and the payee and their banks. Unlike cash, non-cash payment transactions have two process flows: the flow of the physical instrument and the flow of funds. These two flows can differ in timing and direction. Each payment instrument carries its own set of standards for the timing and direction of the payment.

^{2/} This "clearing function" includes depositing, sorting, presentment and inspection.

^{3/} This "settlement function" consists of the transfer of "good and final funds" to discharge the obligation.

Payment instruments can vary by:

<i>Payment Flow</i>	<i>Payment Media</i>	<i>Process Flow</i>	<i>Settlement</i>
<i>Debit</i>	<i>Paper</i>	<i>Batch</i>	<i>Immediate</i>
<i>Credit</i>	<i>Electronic</i>	<i>On-Line</i>	<i>Provisional</i>
	<i>Telecommunications</i>		<i>Net</i>
	<i>Plastic Card</i>		<i>Gross</i>

These payment instruments can be combined to meet the users' needs. For example, time-critical payment applications require electronic media processed on-line. If the time-critical application transfers high value payments, the system is generally credit based and settled on a transaction-by-transaction (gross settlement) basis to provide immediate finality to minimize credit risk. Less time-critical applications may be processed in batches in paper or electronic form to minimize costs.

Paper-based payments, such as checks or payment orders are processed manually or contain machine readable characters for high speed computer processing. The advantages of paper payments are that they do not require the initiator to have access to a computer and they provide documentary evidence of proof of payment. The major disadvantage of paper payments is that they require physical handling and transportation to enable the exchange between the payer's and the payee's banks. This generally makes paper payments more costly and more time consuming than other payment instruments.

Electronic payments are instructions passed between banks without reliance on paper processing or shipment. These systems are ideal for high volume, repetitive payments such as wage and utility bills and for moving large, time sensitive payments. Electronic payments are not always cost effective for high volume, low value payments that are not time sensitive, particularly in emerging countries with limited access to technology.

Card-based payments are used for consumer payments made at the point of sale (POS). Examples of card payments are ATM cards, credit cards and debit cards. The magnetic stripes on the back of the plastic cards provide information about the cardholder for security and processing efficiency. Technically, the credit card is not a consumer payment instrument. The consumer does not transmit funds when the credit card is used. The credit card transaction triggers a payment to the merchant supplying the service to the consumer. The consumer pays the bill later by another instrument, usually a check.

There are two types of payment flows – **debit and credit**. In a credit transaction, the transaction and the payment flow through the banking system in the same direction. An example of a credit transaction is direct payroll deposit. In a direct deposit transaction, the payment instrument flows from the paying corporation to the paying bank to the payee's bank to the payee. The flow of funds follows the same path.

In a debit (check) payment the check flows through the banking system from the payee to the payee's bank to the payer. The flow of funds moves in the opposite direction from the transaction.

From a credit risk standpoint, the credit payment is generally superior because funding can be verified before the transaction is initiated (funds are in the customer's account before the payment is made). However, from a convenience standpoint, a debit transaction may be preferable in certain cases. All developed countries use a mix of debit and credit payments. In general, credit payments have increased in usage because they eliminate the risk of a payment made against insufficient funds and the cost and time delay that a returning for insufficient fund payment would entail. This is particularly important for high volume payments, for which almost all countries are using a credit transfer system.

Payment processing methodologies fall into two broad classes. On-line processing accesses the customer account for each transaction when the payment is processed making the entries to the customer account simultaneous with the processing of the transaction. Batch processing groups transactions and makes the posting to the custom account at a later time.

On-line processing tends to reduce the risk of payment failures and increases the speed of payments. However, on-line systems tend to be more expensive for high volume applications because each transaction is handled individually, rather than in bulk. On-line systems require sophisticated data communications, which can be a problem if a country's telecommunications infrastructure is inefficient and unreliable.

Settlement finality (immediate or provisional) refers to the method and timing by which settlement takes place. Payments can carry immediate finality; that is, the funds are immediately and irrevocably available to the customer or the funds can be provisional until a later date. Provisional payments are generally used with batch processing or with debit payments to allow time to confirm funding. Immediate payments are used most often with credit payments when the funding can be validated before the transaction.

Immediate finality payments present less credit risk to the payer and payee, but more risk to the banking industry. Settlement is guaranteed with little opportunity for verification because of the speed at which these transactions take place. Notwithstanding the risk, immediate finality is a virtual requirement for high value systems where the ability to transfer (and retransfer) funds rapidly is a necessity.

2. What contributions can efficient systems make to the development of modern, market-based financial institutions and markets?

There are many reasons why an efficient payment system is necessary in advanced and emerging countries:

Promotion of economic activity. Payment systems promote economic activity, particularly domestic and international^{4/} commerce and trade. Without reliable, efficient and timely payment systems, companies cannot conveniently acquire raw materials, pay wages and promote economic growth. Payment delays (called debit or credit float) increase intermediation costs and reduce economic welfare. The problems increase if the country experiences high inflation. The more funds are tied up in clearing and settlement, the less funds are available for productive use.

^{4/} *The discussion of inter-republican payments falls outside the scope of this paper.*

Improved control of monetary aggregates. Large and unpredictable float levels (which add or subtract reserve money) influence short-term liquidity in the economy and introduce additional uncertainty in controlling monetary aggregates. Many countries counter the lack of available financial resources by printing more money, which leads to higher inflation and large swings in the money supply. An ideal payment system would minimize delays (within economic reason) in the transfer of funds. The ability of central banks to manage and enforce reserve requirements efficiently and use indirect policy instruments to conduct monetary policy (through open market operations) depends on a nationwide integrated and reliable payment system.

Reduced transaction costs. Efficient payment systems minimize transaction costs. An expensive payment system only drains resources from more productive use. Thus the development of a national payment system must consider the total cost of labor and capital to operate the system.²¹ Capital resources in emerging economies usually have a higher opportunity cost than in developed economies because of the scarcity of capital and hard currency. On the other hand, labor is plentiful and inexpensive in many emerging economies. Thus a nation's payment system must be subjected to a cost-benefit test. State of the art systems are not always the optimal solution, particularly in emerging economies.

Economists address the importance of an efficient payment system from two different perspectives and levels of aggregation. At the macroeconomic level their concern is the relationship between the payment system's efficiency (reflected in the velocity of the circulation of money) and the supply of money for a given level of aggregate economic activity. At the microeconomic level, economists look at the efficiency of the payment system indirectly as part of their broader interest in the welfare losses resulting from higher transaction costs (appendix 1).

Credit risk control. Unless the transfer of value is complete in a reasonably short time, outstanding obligations expose counterparties to the failure of others. An efficient payment system, which includes codified user rights and responsibilities, can reduce banking and commercial risk.

Financial sector development. The payment system is a basic component for a country's financial sector infrastructure and can facilitate the development of new financial instruments, products, institutions and markets such as debt and equity markets. This is particularly true for former communist countries where government ownership of businesses obviated the need for efficient payment systems.

Security and reliability. Emerging countries (and developed ones) can be skeptical about new technologies and lack faith in financial instruments other than cash. New systems (non-cash or cash) must win the user's confidence by being dependable and reliable. Consumers must be protected against unauthorized access and fraud.

Products. An efficient payment system not only opens the door to increased competition through better service and cheaper transaction costs, but enables financial institutions to develop new products (card-based consumer systems, bank remittances) which can become important sources of fee income. The efficient transfer of funds combined with increased competition would eliminate or greatly reduce the incentive banks in many transitional socialist economies have to delay payments and follow other rent-seeking behavior detrimental to the users of financial services.

²¹ *In many countries, engraving and currency handling costs can be high. As a nation's payment system evolves, its reliance on cash as a payment instrument lessens.*

Institutions. Given how weak intrabank payment systems are in many emerging countries and socialist economies in transition, banks cannot manage their treasury operations efficiently. For example, bank branches must post reserve requirements in innumerable correspondent accounts at the central bank regional offices, creating nightmarish management problems for the head offices of the central and commercial banks. Banks cannot compensate for excess liquidity in a branch with deficiencies in other branches.

Markets. An efficient payment system supports privatization efforts. It provides impetus to the development of the interbank and money markets facilitating the transfer of funds across highly compartmentalized economies (region and sectoral). These markets will improve monetary control, develop open market operations and rationalize liquidity and treasury management across the economy and institutions. A payment system would help develop the capital market and the Government Securities market. Money, bond and equity markets will benefit from a modern, reliable payment system. Business privatization requires that payment for goods and services be made promptly and accurately to enable them to operate profitably.

3. What elements are necessary for payment systems to operate efficiently?

Payment speed. Each payment need not be transferred between payee and payer instantaneously. While modern technology would permit such rapid movement, it would be cost prohibitive to move all payments in this way. Even in developed countries, few time critical payments are made in real time. However, the problem in many underdeveloped countries is that payments may take as long as 30 days to be made. These delays create uncertainty about the eventual completion of the transfer (risk), and limit the beneficiaries' ability to reinvest the funds in raw materials and capital expansion.

In developing a national payment system, final payment transfers must occur in no more than 3 to 5 days to make routine payment between two parties within the country. The system should transfer time critical (often high value) payments no later than the same day.

Payment certainty. Users must be confident that once a payment has been initiated, it will be completed to the right party for the correct amount within a prescribed time. If users are not confident about the certainty of final payment, they will continue to use cash to make payments or demand cash for receipt of payments, rather than use non-cash payment instruments.

Payment certainty requires a structured operating capability with good controls. It needs rules and regulations governing not only the basic payment flows, but the resolution of errors and disputes. Finally, it requires an oversight body (the central bank or bank consortium) to enforce rules and resolve disputes between payment system providers.

Reliability. The system must be reliable to obtain and retain user confidence. No system will operate as designed all the time, but it must have adequate contingency provisions and controls to ensure reasonable access to historical records for audit trail. Systems must be designed with adequate back up capabilities if one or more major processing stations fail. This is critical in emerging countries where the reliability of basic infrastructure needs (electricity, telecommunications, transportation for workers and physical documents and technical maintenance staff) may not reach developed country standards.

Safety and Security

Fraud control. The system must be designed with adequate controls to ensure against unauthorized access or tampering with payment system data. This requires the ability to identify the payee and payer properly and to ensure that amounts or beneficiaries of transfers cannot be altered to the benefit of either party to the transaction or to a third party.

Credit risk control. Payments systems move funds between two parties, often without the receiving party knowing whether the funds exist in the payer's bank. This creates credit risk between the two parties to the transaction, between the two banks and, perhaps, between the central bank and one or more banks. Credit risks should be understood and managed (if not eliminated) for each transaction.

Confidentiality. Payment system users must be confident that their payment system data will not be available to unauthorized sources. Data should be protected from access during the transaction and after the payment is processed.

Record maintenance. Each party to a payment transaction must be able to prove their role in the transaction to prove payment has been made and provide tax information. The integrity of transaction records must be maintained, and the time frame for record retention must balance cost and access requirements.

Convenience

The payment system must be convenient for users or they will use cash or other instruments. If the system requires automation for each participant or it requires one or more bank visits each time a payment is made, it may not be usable in developing countries.

Costs

The design must be the lowest cost to all using parties subject limits on speed, certainty, reliability, safety and convenience and not just the lowest cost. These competing considerations lead to multiple systems to respond to the different transaction needs. For example, a system for handling time critical, high value payment requires greater speed and security (at a higher cost) than a system for handling bill payments. It is often cheaper to develop multiple systems than to try to use the most functional system for each payment, regardless of need.

In emerging countries, these elements of an efficient payment system tend to be incomplete in one or more critical ways, be they too slow, lack certainty and reliability and/or have significant security and risk problems. In responding to these inadequacies may need short-term fixes to the current payment system to deal with the most serious problems before an entirely new system, which may take years to implement, is operational.

4. What are the operational characteristics of a modern payment system?

The following elements are all necessary processing activities in a modern payment system:

Originator processing. The originating bank receives payment instructions (debit or

credit) from its customer and performs certain basic functions, regardless of the type of payment. The bank must verify the customer's and the item's authenticity, post the transaction to the customer's account (debit the customer's account for a credit item, credit for a debit item) and set up the appropriate offsetting accounting entry to the counterpart bank or clearing agent. The bank must sort the item by clearing agent and transport the item to the clearinghouse. The transportation can be physical for paper payments or telecommunications for electronic items. If items are sent in batches, a covering paper or electronic transmittal register provides control totals and listings for account reconciliation. With electronic items, security precautions must be taken to prevent access or alteration of the data. The originating bank must also establish archival records of the transactions for account reconciliation.

Clearing. Clearing includes the physical exchange of payment instruments between the payer's bank and the payee's bank (or their agents). Clearing process can be centralized in a clearinghouse (participants exchange payment instruments among themselves on a multilateral basis). Alternatively, the clearing can be distributed (the originating and receiving banks deal directly with each other on a pair wise basis (bilateral clearing)).

Clearinghouses simplify the exchange process.^{6f} For paper payments (checks) there may be multiple clearinghouses, one in each major city within the country to minimize the document shipping time and costs. Electronic payments may be subject to a single nationwide clearinghouse or many geographic or competitive clearinghouses. Because payments (consumer payments) occur within narrow geographic areas, paper items are often processed locally or regionally to avoid lengthy transportation delays to and from a central point, or to reduce message traffic and telecommunications costs for electronic payments.

Settlement. The settlement process transfers the transaction value between the originating and the receiving banks. To settle payment transactions, the two participating banks must have account relationships with each other or each must have accounts with a common third party. Transaction accounts at banks on behalf of banks are called correspondent accounts or clearing accounts. If Bank A presents \$100 in debit payment items to Bank B, and Bank A holds an account with Bank B, Bank B would credit A's account for \$100 to settle the item.

Pair wise settlement is cumbersome and can lead to systemic risk in the country's banking system. For example, if a country has 10 banks, and each bank holds a correspondent account with the other banks, a minimum of 45 account relationships would be required.^{7f} This distributed settlement is operationally inefficient, requires large balances to be held until settlement and can lead to systemic risk if a principal correspondent bank fails and cannot repay correspondent balances to the other banks.

Centralized settlement is often used for all or part of a country's payment settlements.

^{6f} A clearinghouse is an institution established by a group of banks (with or without the central bank's participation) to settle obligations. Each bank settles its obligations by paying the clearinghouse for the net amount owed to the rest of the members.

^{7f} To calculate the number of permutations (P) of r objects from a collection of size n, denoted as $P(r, n) = [n! / (n-r)!]$, where n! denotes a factorial $[n! = n.(n-1).(n-2)...2.1]$. If the order of selection is important then $P(2, 10) = 10!/(10-2)! = 10!/8! = 90$ (90 correspondent accounts would be required). However, if the order of selection is not important then there are r! ways to order r objects and the number of combinations (C) of r objects taken from n objects $C(r, n) = n!/[r!(n-r)!] = P(r, n)/r! = 90/2 = 45$.

Under a centralized settlement operation, all banks maintain a clearing account with one bank. The settlement bank processes the settlement transactions between the originator and the receiver on its books. In the 10 bank example using centralized settlement, ten accounts rather than 45 would be required²⁷ and less money would be required for settlement because liquidity would be less fragmented. Centralized settlement has operational and liquidity advantages over distributed settlement. However, if the single settlement agent is a commercial bank, centralized settlement will increase the systemic risk of bank failure over a distributed system.

In most developed countries, the nation's central bank serves as the primary settlement agent for payment transactions. The central bank provides the operational and liquidity advantages of centralized settlement. Because the central bank cannot fail (unless the government fails), no systemic risk is inherent in central bank clearing balances. In most countries, banks and other financial institutions are required to hold balances with the central bank for monetary policy, liquidity, safety and soundness. Using these balances for settlement allows them to perform double duty, and minimizes the financial resources tied up in payment processing.

Central bank settlement can take place in one of two forms. Gross settlement happens when each item is settled separately. Net settlement happens when exchanged values are netted between participants and the residual balance is settled in the central bank's books. For example, assume three banks exchange payment and each has a single \$100 debit against the other two banks. In a gross settlement, each bank would make four settlement entries -- two \$100 debits and two \$100 credits or 12 entries in total. A net settlement would calculate each bank's single net position with the settlement agent and post a single entry (in this case zero) for each participant. This is also known as multilateral netting, an arrangement between three or more parties in which each member makes payments to a clearinghouse for the net payments due to the other members and receives the net amounts due from the other members from the clearinghouse. Multilateral netting has significant cost advantages over gross or even bilateral netting, but contains greater legal uncertainty in the case of failure of one of the settling participants.

Receiver processing. The receiving bank performs several tasks to complete the payment transaction. The bank must post the item to the receiving customer's bank account (credit to account for a credit item; debit to account for a debit item). The bank may have a requirement to notify the customer of the payment by phone, mail or regular periodic statement. The payment instrument (e.g. check) may accompany this notification. The receiver may have requirements to verify the item's authenticity (signature verification) before posting, verify the availability of funds (for a debit item) and archive the payment transaction record for reconciliation and error resolution.

The receiver may be the bank branch where the receiving customer has an account, any branch of that bank, or the bank's central or regional processing center. The receiver's physical location often depends upon automation within the bank and the presentment rules within the country.

Clearing and settlement must be organized cooperatively within the nation's banking industry, striking a difficult balance between cooperation and competition. Banks compete for customers based upon how they differentiate their originator and receiver processing. Payment instruments clearing and settlement standards and rules must be developed in concert. The embryonic state of development of private financial intermediaries in most transitional socialist economies argue strongly for the central bank to take a leadership role in payment system design and development. In more advanced market

²⁷ $C(r, n) = 10!/[1!(10-1)!] = 10!/9! = 10.$

Types of Payment Systems in Mature Market Economies

Box 1

In most developed countries, these elements have been combined into several systems, each satisfying a particular payment system need. The principal payment systems are:

- **Paper Based, Batch System** - Even given today's modern technology, virtually every developed country still relies heavily on a paper-based debit (check) system. Check volume ranges from about 10% of all cashless payment transactions (in Germany and Switzerland) to over 50% (in USA, Canada, France and UK). In addition to paper-based debit systems, most European countries also have a paper-based credit system (Giro) which accommodates a significant portion of payment transactions. As technology advances have permitted, some of these formerly paper-based transactions have been converted to electronic, but the biggest influence of technology has been to improve the cost and speed of processing paper-based items, rather than replacing paper with all electronic. This is true for two principal reasons. First, paper-based payments are generally the most convenient to originators as paper-based payments do not require the originator to be automated. Thus, while large businesses are now easily able to originate electronic payments, many smaller businesses and most consumers are not. Second, for many applications, most notably checks, paper items (containing the originator's signature) provide greater security than electronic payments. Paper-based credits, which can be subject to signature verification at the originating bank, are much more amendable to truncation and electronic processing. In any event, most developed countries utilize the same technology for processing paper debit and credit items and they therefore can be considered part of one system.

Settlement for paper-based items is usually provisional and settled through clearing accounts held at the central bank or correspondent commercial banks. Clearinghouses operate in many developed countries, with settlement taking place on a net basis, usually through the central bank.

- **Electronic Batch Systems** - In the last ten years or so, many formerly paper-based items have been converted to electronic payments. These batched electronic payment systems, often referred to as automated clearing houses (ACH) are used to process direct debits and credits, recurring payments, truncated (paper items converted to electronic data capture with paper truncated) credit payments and corporate payments. In concept, these electronic systems are very similar to their paper-based counterparts, except that electronic processing replaces paper-based processing, and telecommunications usually, but not always, replaces physical delivery. Settlement and finality for these systems are very similar to paper systems.
- **High Value (Time Critical) Systems** - As financial markets mature and technology permits, "high value" payment systems are being implemented in many developed countries. The use of the term "high value" is somewhat misleading as the key feature of these systems is speed rather than the value. These high value systems are designed to accommodate payments that require same-day transmission, settlement and finality. Usually, these systems are processed as virtual on-line applications rather than batch. To control credit risk, they are generally restricted to credit payments that are settled on a gross basis through the nation's central bank. Because of the need for speed and security controls, these systems tend to have the highest per transaction costs of any payment system. These higher costs tends to restrict traffic to truly time sensitive transactions, which are of low volume but high value. Examples of payments requiring this capability are funds purchased to cover potential clearing account overdrafts; the purchase and/or return of funds invested in overnight or other money markets for cash management purposes; or the transfer of funds for immediate payment, such as to close on a financial contract. In addition, these systems often support the settlement of transactions made across other financial markets, such as Stock or Money markets. These markets are often vital to economic development of the country and, therefore, so is the development of the supporting payment system(s).
- **Card-Based (Consumer) Systems** - The final significant payment system is the card-based system used for credit cards, Point-of-Sale (POS) debit cards and Automated Teller Machine (ATM) transactions. These three applications share many similarities, including: card-based technology; need for an authorization system to authenticate the user and validate the transaction; and usually low transaction value which replaces a cash transaction.

There are also several differences between these applications. The more significant are:

- Applications do not always use the same settlement system
- Card access devices are not always identical
- Cardholder verification techniques are not always identical (e.g., PIN numbers versus signature).

Despite the differences, the basic requirements of all card-based applications and system needs are similar enough to consider them one system. Because these systems all involve the exchange of immediate value for the transaction (cash at ATM's; goods or services for credit and debit cards); it is vital that authorization and validation take place on a real time basis. This requirement makes the use of a real time authorization system essential, although settlement can and often does take place after the fact.

economies opportunities for reducing transaction costs or risks are often identified by private participants in the payment system. Professional organizations can discuss transaction costs and recommend changes in current practices and systems to the regulatory authorities. Central banks are generally the custodians and lenders of last resort in the payment system.

Nature of payments. Payments can be interbank (payee and payer use different banks), intrabank (payee and payer use different branches of the same bank) or on-us (payee and payer use same branch). Interbank payments are cleared and settled through the interbank clearing and settlement mechanism. That is, a third party or parties provide clearing and settlement functions. Intrabank payments are sometimes processed, cleared and settled through the single bank. The more concentrated the banking system, the higher the percentage of intrabank transfers.

The interbank system requires cooperation among all users. The systems are jointly owned by the nation's banks or the central bank. By definition, intrabank systems are owned by the individual banks. The banking industry must develop and invest in both interbank and intrabank payment systems to serve the customer needs for payment services.

5. What is the Central Bank's Role?^{2/}

The nation's central bank plays an important role in creating payments systems policies, coordinating regulations and standards and providing most of the nation's payment settlement services. Each central bank plays a different role in the degree to which it provides payment services other than settlements. In some countries, the central bank is an active provider of payment services, often competing with the commercial banking industry (U.S., Germany, and Japan). In other countries, the central bank plays almost no operational role (U.K.). The central bank has a legitimate and important role in guaranteeing the safety, soundness, efficiency and fairness of the payment system.^{10/} The central bank as the lender of last resort must have the information and the means to oversee and, if necessary, assist the institutions participating in the payments system. Given the central bank's roles and its special responsibility to avoid systemic risk, any large-value payment mechanism requires the central bank's particular attention.

Central banks in transitional socialist economies and many developing countries have more responsibilities than central banks in market economies in leading and coordinating payment system reforms. Although the central bank's involvement in the operation system varies from country to country depending on the strength of its commercial banks, the central bank must play an entrepreneurial or facilitating role in all aspects of payment systems design and development.^{11/} The central bank's

^{2/} Summers, Bruce. 1991. "Clearing and Payment Systems: The Role of the Central Bank", Federal Reserve Bulletin, Washington D.C. pp. 81-91.

^{10/} Hook, Andrew T. 1992. "Managing Payment System Risk During the Transition from a Centrally Planned to a Market Economy", IMF Working Papers, WP/92/95

^{11/} "In most cases, the long-term scale nature of the transition to a market-oriented system, the scarcity of resources in both public and private sectors, the shortages of skilled personnel, lack of experience in the private sector, and the potential costs of lagging behind other aspects of the reforms all support a major role for the central bank", op.cit., page 14. We could add two needs: to borrow from international financial institutions (IFIs)

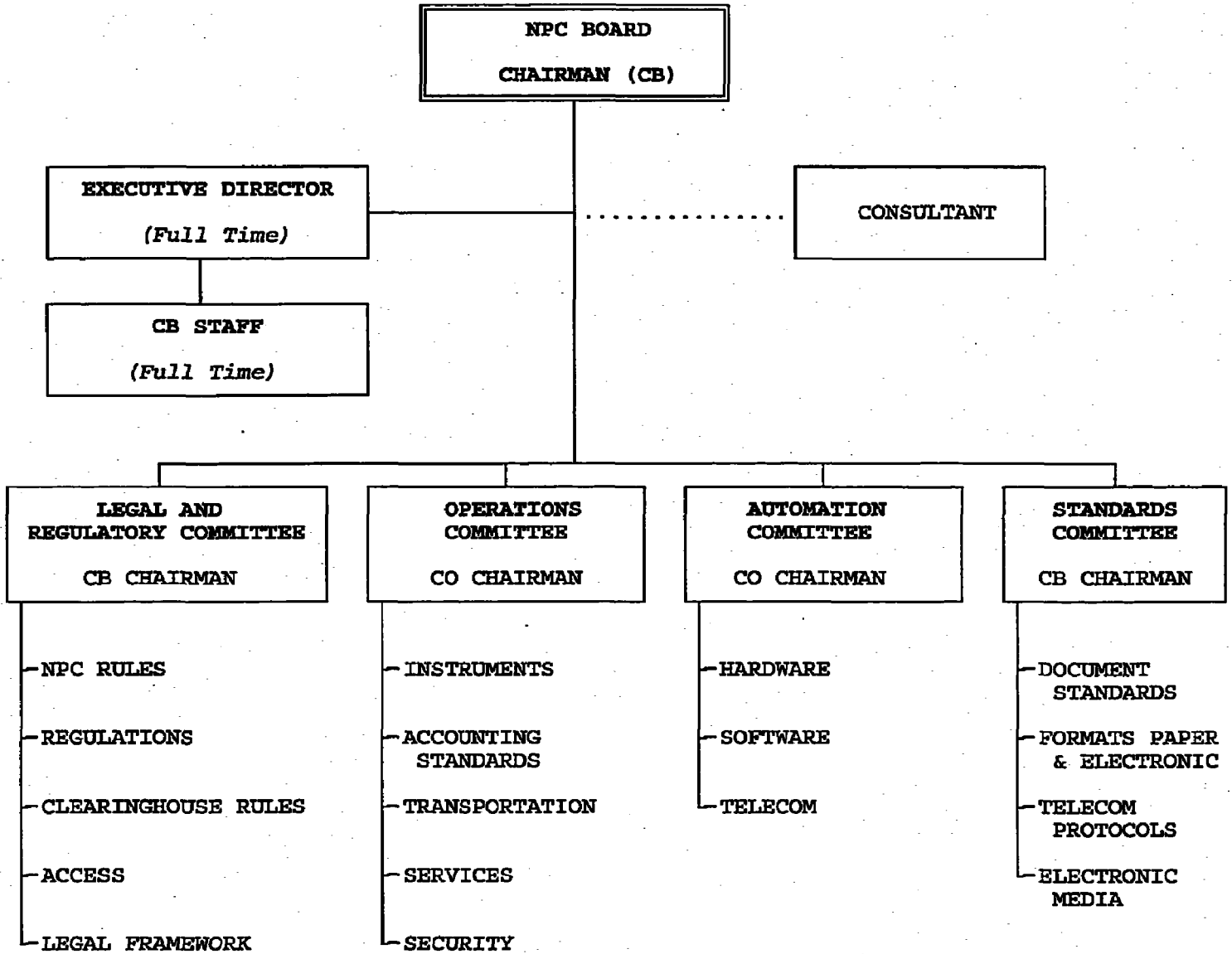
leadership in payment system development does not automatically qualify it to play the role of payment system operator. In some instances, the central bank might become part of the problem, rather than part of the solution when the bank ignores users' needs or adopts heavy-handed, top-down approaches with limited or no commercial bank participation.

An important component of the central bank's leading role is to create an organizational structure to coalesce domestic and external actors, functions and interests. This is critical for socialist economies in transition, given their history of severe compartmentalization in a centrally planned economy (CPE), top-down commands and poor cooperation among different agencies and different departments of the same agency or institution. The central bank must take the initiative and set up a national payments council (NPC) to lead payment systems reform. The NPC must:

- (i) be a forum (talking shop) for the central and commercial banks to discuss and agree on how to establish and oversee the functioning of the national payment system and how to coordinate central and commercial banks' policies in the payment system (the harmonious development of inter and intrabank payment systems);
- (ii) channel and absorb external technical assistance.

A sample organizational structure and a charter outline for a hypothetical NPC are shown in chart 1 and in box 1. Each country might develop its own structure based upon its banking structure and capabilities.

NATIONAL PAYMENTS COUNCIL (NPC)
(Sample Organizational Structure)



Note: CB = Central Bank, and CO = Commercial Bank

The allocation of the Chair of the proposed Committees to CB or CO can vary from country to country.

NATIONAL PAYMENTS COUNCIL (Sample Charter)

Two classes of membership will be open to all financial depository institutions:

- **Full Membership** for the central bank, large (often state-owned) commercial banks, and savings banks and other significant financial depositories. Full members must originate or receive more than a prescribed percentage (3%) of the payments volume or value in the previous year. The prescribed percentage limits the number of full members to between 7 and 10.
- **Associate Membership** for all other financial institutions.

Governance. A Board of Directors will govern the NPC. Permanent directors will represent the central bank, the large commercial banks, the savings bank, the Bankers Association and other financial depositories and banks. Each board member will have one vote. The central bank will have veto power over the NPC's decisions on rules and regulations, the safety and soundness of the payment system and competitive equality.

The associate members will elect directors each year for rotating two-year terms. Directors must be governors or deputy governors from the central bank and presidents, chairmen, vice chairmen or senior policy makers from commercial and savings banks.

The board will appoint a full-time Executive Director to serve as Staff Director and Secretariat. The executive director will select and manage the full-time staff, support the foreign consultants and liaise with the system's participants. Other responsibilities include establishing an annual budget, overseeing committee activities, arranging board and committee meetings, follow-up and regular reporting. A core group of full-time staff will coordinate the work performed by the NPC's committees and senior staff from the banking sector.

Committees and Subcommittees. The NPC will maintain four permanent committees:

- Rules and Regulations
- Operations
- Automation
- Standards

Each full member will appoint one representative to each committee. Associate members as a group will appoint no less than one and no more than three representatives to each committee. Committee members must be senior, full-time bank employees with direct responsibilities for the committees' functions within their banks. If the committee member cannot attend a meeting, a deputy reporting directly to the committee member may represent the institution.

The central bank will chair the Rules and Regulations and Standards committees. Full members will chair the Operations and Automation committees. Chairs will represent commercial banks and will serve terms of not less than one year or more than three years. Committees may create subcommittees to discuss technical matters.

User Orientation. Regulators, users and participants coordinate the payment systems in most countries. Arrangements are more formal (UK) or less formal (US) and vary from country to country. The coordinating organization may be an existing institution, such as the National Bankers' Association, or an institution created specifically to perform this function.

Payment System Oversight. An efficient payment system requires the cooperation of all banks and their customers and an effective means of providing payment system governance. Governance must address these issues:

- Who provides prudential oversight to ensure the system's safety and soundness, including the standards for credit and liquidity risk?
- Who establishes the rules to ensure equitable access and conformity of interest among the participants?
- Who establishes the standards to permit the free exchange of payment data between participants?
- Who sets the financial terms to ensure that the system recovers capital and operation costs.

In most countries, the central bank and the commercial banks (or one or more commercial bank consortiums) define or provide oversight. No single commercial bank can provide oversight for competitive reasons.

Payment Systems Organization and Cost Recovery. Interbank payment systems can be organized in several different ways. Some methods differ by country; most countries employ several methods. Cooperative ventures between commercial banks and the central bank are needed to establish common rules, formats and instruments. However, it is also common for large commercial banks to operate within a segment of the payment system for smaller, downstream correspondent banks.

A coordinating body provides governance. In some countries (Canada and the U.K.), the coordinating body provides guidance for rules and standards and operates the interbank system. In this model, the largest banks have equity ownership in the association and receive voting rights in return. Users may pay for services on a per usage (item fees) basis or annual assessment basis (often tied to prior year usage).

A second model establishes local associations (clearinghouses) to set collection rules and procedures for the local area. Most payments tend to be cleared within a local commercial zone, although this is less true for commercial than for consumer payments. The organization and funding for local clearinghouses tends to be similar to national associations.

In the third model, the central bank operates a payment system (often in competition with the private sector.) Eligible financial depository institutions participate pay fees based on usage only (no outside equity partners). The method of establishing these fees varies from full cost recovery to partial subsidization.

The fourth model is the correspondent bank payment system. A large bank provides payment services (subject to rules and standards) to smaller banks. The correspondent bank provides such services to fully utilize capacity obtained for in-house purposes. The costs are usually recovered through item fees or compensating balance requirements.

6. What problems do countries face when developing payment systems?

In developed countries, most recent payment system initiatives were built upon a mature base. Users and suppliers had non-cash payment system expertise and an infrastructure to support non-cash payments. Interbank decision making bodies reviewed the practicality and acceptability of payment system initiatives. Mature accounting and intrabank settlement systems post customer accounts across branches of the same bank and with the Central Bank.

These conditions do not exist in many emerging countries. Although emerging countries may want to leapfrog past early developed country efforts into state of the art systems, the rapid change may not be practical from a financial, institutional or human resource standpoint. Early efforts in developing and transitional socialist economies should be implementable and practical. Once the initial efforts are in place and the country has a base of knowledge upon which to build, rapid advancement may be feasible. The critical payment design issue facing emerging countries is to identify the most important payment applications and develop a system that can be easily installed and used in commercial banks and central banks.

The most important payment application in most developing countries is the processing of commercial payments for the purchase and sale of goods and services between two businesses because of trade's importance to economic development and because of the high dollar value of such transactions (compared to consumer payments). The second most important application is a time critical payment system to make large value transfers within minutes. A time critical funds transfer system becomes necessary for banks to manage their settlement positions with other banks or the central bank.

Payment Development Priority

<i>Payee/Payer</i>	<i>Consumer 1/</i>	<i>Business</i>	<i>Government</i>	<i>Financial Institutions</i>
<i>Consumer</i>	<i>Low</i>	<i>Medium</i>	<i>Low</i>	<i>Low</i>
<i>Business</i>	<i>Medium</i>	<i>High</i>	<i>Medium</i>	<i>Medium</i>
<i>Government</i>	<i>Low</i>	<i>Medium</i>	<i>Low</i>	<i>Low/Medium</i>
<i>Financial Institution</i>	<i>Low</i>	<i>Medium</i>	<i>Medium</i>	<i>High</i>

1/ Cash may satisfy the payment needs of most, if not all, consumer payments in emerging economies.

NOTE: These priorities may vary slightly by country.

Other conditions that effect the payment system design in underdeveloped countries are:

- the lower wage scale of emerging countries and the higher technology costs in the cost/benefit analysis of automation
- the lack of broad-based consumer transaction accounts limits the immediate need for

consumer based payment systems such as credit cards, debit cards and ATMs

- the need for project management skills necessitates outside assistance to implement system initiatives, such as payments processing
- the need for laws and regulations for payment systems
- the need for internal accounting and operation systems to support the customer accounting component of payment systems
- the need to rationalize central bank settlement services, including accounts consolidation by geography or type of account.

Each problem requires a unique solution based upon the country's infrastructure and banking culture. Payment system solutions cannot be imported. They must be adapted to meet the local environment by experienced experts.

7. What is the World Bank approach to selected payment system design, implementation and initiatives?

Why is the World Bank involved in payment systems modernization projects in emerging countries and socialist economies in transition? The value transferred through the payment system by a country's economic agents is really a reflection or the dual image of the activity taking place in its economy.^{12/} The bank has a mandate to promote economic development and has taken keen interest in developing and modernizing the aspects of a country's infrastructure that promote faster, productivity-enhancing economic growth. Removing the bottlenecks for financial sector development must be one of its priorities. The bank is interested in:

- the payment system as a public utility (with externalities resulting from increased speed, reliability and safety in the transfer of value);
- the potential rates of return resulting from sharp reductions in transaction costs and from drops in float levels and costly delays in the transfer of funds (particularly in hyper-inflationary environments), which can be achieved with modest investments and improvement in existing practices;
- the potential for developing less distorting and more efficient indirect policy instruments for macro-control (open market operations);
- the potential to receive World Bank loans to finance technical assistance (design work and other consulting services), training and capital investments (hardware and software) for inter and intrabank payment system development, and grant financing provided by donor countries and cofinancing from other IFIs; and

^{12/} *As economic development proceeds labor specialization creates new demands for the transfer of value within and among countries.*

- the development of the financial sector, payment instruments, institutions and markets (money and capital markets).

World Bank assistance for payment system development and bank automation has expanded rapidly in the last two or three years. A list of countries and loans granted or tentatively planned are included in table 1.

Table 1
WORLD BANK LENDING
FOR
PAYMENT SYSTEMS DEVELOPMENT AND BANK AUTOMATION
(Millions of US\$)

Country	TA/Design	Hardware Payment Systems (Interbank)	Bank Automation (Intrabank)
Africa:			
Angola ⁽⁵⁾	-	1.00	3.5 ⁽²⁾
Egypt ^(Note)	-	-	-
Ghana ⁽⁵⁾	-	3.50	4.5
Asia:			
China:			
Phase I	2.50 ⁽¹⁾	40.00	-
Phase II ⁽⁷⁾	-	200 - 400	300 - 500
Viet Nam	1.00 ⁽¹⁾	25 - 30 ⁽⁶⁾	
Eastern Europe:			
Hungary	0.40	13.50	4.1 ⁽²⁾
Poland	-	-	40.0 42.0
FSU:			
Kazakhstan ⁽²⁾	0.40	29.65	23.4
Moldova	T.D.	T.D.	T.D.
Russia ⁽²⁾	1.54	200-250	250.0 ⁽³⁾
Turkmenistan	-	7.00	-
Ukraine	0.85	1.90 ⁽⁴⁾	-
Uzbekistan	0.40	3.50	0.9 ⁽²⁾

Notes:

- (1) Grant
 - (2) Central Bank automation
 - (3) For 36 commercial banks (probably cofinanced with EBRD).
 - (4) Could be increased through reallocation of IBL funds.
 - (5) Limited to a check clearing system.
 - (6) Includes support for intrabank systems.
 - (P) Planned.
 - (T) Tentative. Possibly cofinanced.
 - T.D. To be determined.
- Note:** IBRD provided consulting services for a program of payment system modernization to be implemented and financed by donors.

The Bank's Approach to Payment Systems Development

Objectives. Financial sector technical assistance (TA) in most payment systems operations tries to develop the host country's human resources and institutional ability to reform its sectoral and institutional policies.^{13/} The Bank's TA finances the transfer of services, knowledge, skills, equipment and technology. The outcomes of this assistance could help policymakers analyze policy options and implement and monitor sectoral strategies, improve project preparation and implementation, and strengthen the country's institutional abilities within targeted institutions or throughout the sector.

The Bank's TA is an important and sometimes necessary component for development. However, TA is not by itself sufficient. An enabling environment and a critical mass of self-reinforcing reforms is required to maximize the benefits of any TA. The borrowers and the implementing agencies' commitment to the objectives is essential for success.

Design and delivery modes. With a highly educated work force technical assistance provides temporary substitutes in selected areas. The country can develop new skills to work toward self-reliance. Countries do not need to reinvent the wheel. They can adapt successful systems for their own needs and avoid mistakes and costly misallocations of resources. On the other hand in designing payment system TA loans, the Bank should be realistic about the beneficiaries' absorptive capacity and phase the assistance pragmatically to attain the objectives identified and agreed between the country and the Bank.

The Bank's TA can be delivered by financing short and long-term advisers, training (study tours) and equipment. The Bank can finance technical services in the field from inter-disciplinary teams from international consulting firms. Complementary support can come from a resident advisor (at the central bank) or periodic visits from specialists from other central banks (as members of IMF missions). The latter assistance can be most useful in the early phases of payment system projects. During implementation phase the central bank staff from advanced market economies can advise the recipient central bank and provide quality control to test the solutions proposed by the external consultant. One successful example of this approach occurred in the China payment system project in the form of an international advisory panel (IAP).

Developing terms of reference (TORs) and a local project management structure. Detailed draft TORs for the payment systems sub-components are needed during the early stage of loan processing. The recipient should agree on the content and scope of the proposed activities. This discussion takes place between the Bank's mission and the central bank. Before the Bank reaches final agreement with the Central Bank, the Central Bank collects the views of all the participants, particularly the commercial banks. The central bank appoints a qualified coordinator for the proposed loan to centralize the activities, make decisions and act as the central contact point for external consultants.

Other organizational requirements. The Central Bank must agree on:

- criteria and selection procedures for consulting services
- procurement and reporting procedures

^{13/} See "Operational Directive 8.40: Technical Assistance," The World Bank Operational Manual, Washington D.C.

- a tentative financial plan based on similar activities in other countries. Realistic budgeting for local expenses will guarantee smooth project implementation.
- implementation procedures and project supervision.

The Bank's experience shows that successful project implementation depends on the borrower's commitment to the project objectives, the institutional and administrative arrangements put in place and the agencies' capacity to monitor progress and introduce early and mid-term corrections. TA is labor and knowledge intensive and the agencies should appoint qualified and dedicated project managers.

Payment System Design

Most countries already use rudimentary payment systems. The country's starting conditions determine the design strategy, but the approach to modernizing the existing system raises some questions. Should the country patch-up the current system or develop a new system? Should the country use a state-of-the-art system or a more labor intensive (but more cost-effective) system? Although these questions are important they do not address the real problems. One possible answer is to introduce short-term improvements in the current payment system until the "optimal" system is ready. The country's dilemma will be whether the short-term improvements move away from the (still unknown) optimal system or move the system development toward the final design. This points to the need to develop a multi-tracked approach to payment system reform.

Cases. A simple example of a multi-tracked approach to payment system reform might look like this. Country 1 is willing and able to follow an orderly centralized (top-down) approach to payment system reform (China). Country 2 is less willing or able to follow a centralized approach because the economy is in crisis. Country 2's banks and payment systems initiatives are outside the central bank's control. The availability of automation skills and equipment suggest a sub-optimal, home-grown approach (Ukraine, Russia).^{14/} Country 1 might not need short-term solutions. The preferred approach might be to develop and test a new payment system and design an orderly migration plan. Country 1's vision of how the system should look dominates and drives the central bank's efforts from the beginning. In Country 2 the short-term, emergency solutions might outweigh the need for long-term improvements. The challenge is how to control the process so that the short-term improvements do not derail the long-term solution.

The Central Bank in Country 2 runs the risk of letting the immediate need become the enemy of long-term reform. The central bank's first priority should be to create breathing space — time for the central bank and other financial institutions to design and implement a long-term strategy.^{15/} The challenge for Country 2 is to design and control a consistent two-track approach (short-term improvements and long-term system design) to payment system reform.^{16/}

^{14/} *In which the system engineers seem to be in the driving seat.*

^{15/} *Hook, A.T. op.cit., page 18.*

^{16/} *See appendix 2 for sample terms of reference from a two-track payment system modernization project in Ukraine.*

Phase 1: Taking stock. The first task is to take stock of the country's existing system and identify the main problems (see appendix 3). Table 2 contains a sample checklist of characteristics that will affect the payment system's design. Many activities in Phase 1 might take no less than four to six months to complete. Two to three months after the project begins it might be feasible to identify the areas needing immediate improvement and the remedial actions required.^{17/} The most important work in Phase 1 is to make short-term improvements while ensuring consistency with long-term improvements.

Table 2
SITUATION ANALYSIS (STOCK TAKING PHASE: A CHECKLIST)

Country Physical Characteristics	Infrastructure	The Financial System	The Current Payment System	Incentives
Size	<u>PHYSICAL</u> Transport System Telecommunication Facilities Mail System	<u>STRUCTURE</u> Central Bank Commercial Banks NBFIS Stock Exchange	<u>INSTRUMENTS</u> Debit Credit	<u>COSTS</u> Relative Prices (Labor/Capital)
Population	<u>LEGAL</u> Laws/Regulations Contracts/Codes Judicial System Enforcement Supervision	<u>LAYOUT</u> Branches Concentration Size Functions	<u>PROCESSING</u> Batch On-Line Speed Traffic	<u>COMPETITION</u> Intense Monopolistic
Terrain	<u>INFORMATION</u> Accounting Systems Reliability Timeliness	<u>ACCOUNTS</u> w/Customers: Centralized Decentralized w/Central Bank: Reserve Clearing Correspondent	<u>CLEARING</u> Bilateral Clearing House	<u>BUSINESS NEEDS</u> Timeliness Interest Rates Inflation
	<u>INSTITUTIONAL</u> Tradition Strengths Organization Efficiency Cooperation Conflict	<u>TECHNOLOGY</u> Automation Centralized Decentralized Intrabank Payments	<u>SETTLEMENT</u> Immediate Provisional Gross/Net Central Bank Settlement Bank Float (D/C) Overdrafts	
	<u>HUMAN</u> Education Skills Know-How Training	<u>DIVERSIFICATION</u> Money Market Securities Market	<u>PAYMENT MEDIA</u> Paper Electronic	

^{17/} A useful technique to enhance the client's ownership of the project and to raise consciousness among senior staff is to hold an introductory payment systems workshop or a full seminar to discuss the preliminary conclusions of Phase 1 with the central bank and the NPC.

	<u>TECHNOLOGY</u> Hardware Software Maintenance		<u>PROCESSING</u> Centralized Decentralized Ownership Operator Backup	
			<u>ORGANIZATION</u> NPC Command Consensual	
			<u>SECURITY</u> Encoding Access Authorization Audit Supervision Liquidity	
			<u>MIGRATION</u> Two Track Incremental Convergence	
			<u>OTHER</u> Weaknesses Strengths Risks Willingness to Change Priorities Short-term Longer-term Costs/Fees	

Phase 2: The vision. To improve the chances of a consistent approach after the completion of the "first cut" diagnostic work in Phase 1, it might be advisable to develop the vision of how the system should evolve and what it should look like after the adoption of the long-term improvements (Phase 2). Overlapping between Phases 1 and 2 will depend on the central bank's ability to create breathing space. The vision should describe: (1) the user needs, (2) the payment instruments, (3) risk control features, (4) the system's requirements and procedures for processing, clearing and settling each instrument, (5) an implementation plan for each payment system, particularly the priority high value transfer system (HVTS).

Table 3
VISION: Conceptual Design

<p>User Needs</p> <ul style="list-style-type: none"> <i>Business</i> <i>Consumers</i> <i>Banks</i> <i>Central Bank</i> <i>Government</i> <i>Other financial institutions</i> 	<p>Payment Instruments Design</p> <ul style="list-style-type: none"> <i>Paper</i> <i>Electronic</i> <i>Card based</i> <i>Hybrid (truncated)</i> <i>Credit transfer/debit transfer</i> <i>Guaranteed/provisional funds (high value/low value)</i> <i>Batched/on line</i>
<p>Risk Control Design</p> <ul style="list-style-type: none"> <i>Settlement risk</i> <i>Fraud risk</i> <i>Security risk</i> 	<p>System Requirements</p> <ul style="list-style-type: none"> <i>Capacity (volume forecasts)</i> <i>Speed/timing</i> <i>Costs</i> <i>Reliability</i> <i>Controls</i> <i>Accounting/settlement</i> <i>Functionality</i> <i>Interfaces</i>
<p>Ownership/Control (better owned by the private sector)</p> <ul style="list-style-type: none"> <i>Equity/ownership</i> <i>Operational ownership</i> <i>Access</i> <i>Standard setting</i> 	<p>Cost Recovery</p> <ul style="list-style-type: none"> <i>Fees</i> <i>Full/partial (subsidized) recovery</i>
<p>Legal/Regulatory Requirements</p>	<p>Other Issues</p> <ul style="list-style-type: none"> <i>State-of-art</i> <i>Off-the-shelf (turnkey)</i>

The vision phase (driven by the users' needs) would be followed by the detailed conceptual design. The conceptual design translate user requirements into technical requirements and bidding documents to purchase equipment and additional technical services.^{18/}

Project Management. In most emerging countries the central bank lacks strong project management expertise. Project design and implementation must include:

- an institutional structure (establishing the NPC)
- a senior project manager with decision-making powers at the central bank, supported by staff from the relevant departments and able to ensure active involvement of all

^{18/} We mention the technical requirements and procurement for completeness sake, but they fall beyond the scope of this paper.

participants (within and outside the central bank)^{19/}

- an experienced consulting firm with strong client orientation to transfer multi-disciplinary skills, with a project manager in the field ("traffic controller", strong in client education and good communications)
- early agreement on decision-making and conflict resolution processes
- an International Advisory Panel (IAP) of experienced central bankers to review and provide advice during project implementation
- thorough project supervision.

Some of the more common traps in developing payment systems are:

- not recognizing the countries starting conditions (identified in Phase 1)
- being seduced by technology
- over or under-estimating the client's absorptive capacity
- focusing on the means rather than the ends (the efficiency gains and the value added by the project)
- personalizing rather than institutionalizing the process and the proposed solution
- poorly defined project scope (vague or overambitious).

Coordination. The World Bank is not the only player in payment system modernization. The IMF is an important contributor to payment system development from the central bank perspective. The Bank can complement these efforts by broadening its scope to include commercial banks and end-users and by providing financing for technical assistance and capital investment. The Bank can also mobilize grant funding to finance the project design and training.

Concluding Remarks

Effective and efficient payment systems are vital for the economic development of emerging countries. Efficient payment systems will help promote the development of commerce, enhance economic policy oversight, reduce the financial, capital and human resources devoted to the transfer of payments and control the risk inherent in moving large values.

^{19/} *The central banks of FSR should include these departments: computer center, automation/systems (standardization), monetary policy, currency issuance, accounting, treasury, payment methodology and bank supervision. One task in the terms of reference for Phase I could be a review of the functional organization of the payment systems area. There seems to be fragmentation, unclear delineation of responsibilities and accountability and poor communication or open rivalry between the departments. A reorganization would improve project implementation and payment operation.*

Many emerging countries recognize the value of an efficient payment system, but lack the financial and technical resources to develop such systems. Many countries turn to the World Bank and other international agencies for assistance. Unfortunately, some emerging countries believe that the entire solution for an effective payment system rests with obtaining modern computer hardware, and believe the World Bank's sole contribution is to finance the hardware costs. Hardware procurement alone will not solve the payment system problems in emerging countries.

Emerging countries need organizational structures and plans for national payment systems before they spend money on computer equipment. Because these countries often lack the expertise to design and operate modern payment systems, they may need technical assistance from financial experts for design before they make large investments in systems development.

The design of a new payment system should be kept simple. Many emerging countries lack the infrastructure and banking sophistication required to leapfrog from basic payment systems to state-of-the-art systems. A two-tracked approach to project design is often the best way for payment system reform. The first task is to fix the most serious problems. The second task is to upgrade the current systems incrementally to meet basic minimum standards of timeliness, security and reliability. As these improvements are made, emerging countries can turn their attention to long-term, advanced solutions.

Although valuable lessons can be learned from other countries, each country's payment system is unique. To simply import another country's system without adjusting for the target country's geography, infrastructure, banking and legal structures, culture and needs could lead to a suboptimal solution. Payment systems development should follow a disciplined plan for defining users' needs, the organization of the project team and project goals. The target country can adapt other countries' experiences for its own use. This requires design work by experienced experts before a new system can be implemented, even if the new system is adapted from another country.

THE ECONOMIST'S APPROACH

The study of payment systems has been the domain of central and commercial banks' specialized staff and practitioners (systems operators). Nonetheless, economists (notably early in the century)^{1/} have examined and formalized in aggregate the relationship between the "velocity of circulation of money", the stock of liquid money (M1)^{2/} and the real economic sector (measured by total transactions at current value in the economy.) Economists' interest in the efficiency of payment systems has concentrated in two areas: the relationship of the payments system to the money supply and monetary policy and, more recently, the study of transaction costs.

1. The Velocity of Circulation

The velocity of circulation of money (V) in the "identity of exchange" $MV = PT$, where M is the stock of money readily transferable (currency (c) plus demand deposits (d)), P is the price level, and T is the volume of trade or transactions in the economy, measures the ratio of a flow of payments (PT) to the stock of money that performs the payments.^{3/} Conceptually V tells us the number of times the money supply must be reused to meet the transaction and payment demands of a given level of aggregate economic activity, making the total transactions at current value to total payments in the economy identical.

When we divide Money (M) into currency (c) and demand deposits (d), and acknowledge that there are several types of transactions the "identity of exchange" is transformed into an equation which is, in principle, observable:

$$(Mc.Vc + Md. Vd) = \text{Sum. Pi.Ti}$$

(Md. Vd) has long been considered a useful indicator of economic activity, in which Md measures bank demand deposit balances, and Vd is the ratio of debits to balances from the banks' books. Some central banks, including the US Federal Reserve Board (see Tables A1 and A2), publish this debit ratio or deposit turnover rate.

^{1/} Fisher, Irving. 1911. The Purchasing Power of Money, 2nd Edition, 1922. Reprinted New York: Kelley, 1963.

^{2/} Narrowly defined as cash plus bank demand deposits.

^{3/} Cramer, J.S. 1987. "Velocity of Circulation", The New Palgrave: A Dictionary of Economics, Eatwell, J., M. Milgate and P. Newman, eds. New York: McMillan Press.

Table A1: U.S.: BANKS' DEPOSIT TURNOVER

(Seasonally adjusted annual rates)

Period	Debits to demand deposit accounts ^(a) (Billions of dollars)					Turnover of demand deposits				
	Total 233 SMSA's	Leading SMSA's		Total 232 SMSA's (excl.N.Y.)	226 other SMSA's	Total 233 SMSA's	Leading SMSA's		Total 232 SMSA's (excl. N.Y.)	226 other SMSA's
		N.Y.	6 others ^(b)				N.Y.	6 others ^(b)		
December 1975	23,565.1	10,970.9	4,912.5	12,594.2	7,661.8	131.0	351.8	118.4	84.7	71.6

Period	Debits to demand deposit accounts ^(a) (Billions of dollars)					Turnover of demand deposits				
	Total 233 SMSA's	Leading SMSA's		Total 224 SMSA's (excl.N.Y.)	218 other SMSA's	Total 225 SMSA's	Leading SMSA's		Total 224 SMSA's (excl. N.Y.)	218 other SMSA's
		N.Y.	6 others ^(b)				N.Y.	6 others ^(b)		
December 1965	5,523.1	2,273.5	1,234.5	3,249.6	2,015.1	50.6	102.2	47.7	37.5	33.3

(a) Excludes interbank and U.S. Govt. demand deposit accounts.

(b) Boston, Philadelphia, Chicago, Detroit, San Francisco-Oakland, and Los Angeles-Long Beach.

Source: Federal Reserve Bulletin (several issues)

Table A2: U.S.: BANKS' DEPOSIT TURNOVER
(Debits are in billions of dollars, turnover is ratio of debits to deposits)

Bank group, or type of customer	July 1993	Annual averages of monthly figures										
		1992	1991	1990	1989	1988 (a)	1988	1987	1986	1985	1984	1983
<i>Seasonally adjusted</i>												
Demand Deposits (b)												
All insured banks	777.1	832.4	803.5	797.8	735.1	622.9	641.2	612.1	556.5	496.2	434.1	376.8
Major New York City banks	4,291.2	4,797.9	4,270.8	3,819.8	3,421.5	2,897.2	2,903.5	2,670.6	2,498.2	2,168.9	1,843.0	1,512.0
Other banks	423.5	435.9	447.9	464.9	408.3	333.3	376.8	357.0	321.2	301.5	268.4	238.5
Other checkable deposits (c)	11.5	14.4	16.2	16.5								
Savings deposits (including MMDAs) (d)	4.8	4.7	5.3	6.2								
ATS-NOW accounts (c)					15.2	13.2	14.7	13.8	15.6	16.7	15.8	15.5
Savings deposits (e)					3.0	2.9	3.1	3.1	3.0	4.5	5.1	5.3
<i>Not seasonally adjusted</i>												
Demand deposits (b)												
All insured banks	776.7	832.5	803.4	798.2	735.4	622.8	641.7	612.3	556.7	497.0	433.2	376.1
Major New York City banks	4,265.3	4,803.5	4,274.3	3,825.9	3,426.2	2,896.7	2,901.4	2,674.9	2,499.1	2,191.1	1,838.6	1,510.0
Other banks	423.1	436.0	447.9	465.0	408.0	333.2	377.1	356.9	321.2	301.4	267.7	238.1
Other checkable deposits (c)	11.4	14.4	16.2	16.4								
Savings deposits (including MMDAs) (d)	4.8	4.7	5.3	6.2								
ATS-NOW accounts (c)					15.2	13.2	14.7	13.8	15.6	16.6	15.7	15.4
MMDAs (f)					7.9	6.6	6.9	5.3	4.5	3.8	3.5	2.8
Savings deposits (e)					2.9	2.9	3.1	3.1	3.0	4.5	5.0	5.3

(a) Revised.

(b) Represents accounts of individuals, partnerships, and corporations and of states and political subdivisions.

(c) Accounts authorized for negotiable orders of withdrawal (NOWs) and accounts authorized for automatic transfer to demand deposits (ATSs).

(d) Money market deposit accounts.

(e) Excludes MMDA, ATS, and NOW accounts.

(f) Money market deposit accounts.

Source: Federal Reserve Bulletin (several issues)

As shown in table 1, the deposit turnover rate in the US has had a long and pronounced increase since the post-War, climbing rapidly from about 50 by 1965 to 131 by 1975, and from then onwards soaring to almost 500 in 1985 and more than 800 in the early 1990s. There are several problems in interpreting

Cramer's ratio.^{4f} The main problem is that more than one type of transaction does not limit bank payments to transactions in connection with current production, measuring indistinguishably, fund movements among one depositor's several accounts, cash withdrawals, the purchase of capital assets, income transfers and money market deals. As shown by the more than 10 times difference between the deposit turnover rate among the major New York City banks and other insured banks (table A2), money market deals are probably the largest single category of turnover. Despite the difficulties that hinder the interpretation of V_d , the spectacular increase in the deposit turnover rate indicates the availability of new financial products and the improved cash management techniques that reduce working balances (prompted, in part, by rising interest rates in the intervening period) and increase the speed payment systems reliability.

For currency payments, V_c presents intractable problems. Nonetheless, rough estimates indicate that V_c is stable, lying between 15 and 20 in developed economies (Netherlands, U.K.) If this is true, V_d is much larger than V_c , so that the steady shift from currency to demand deposits results in an overall increase in velocity (V).

Although the "transactions velocity of money" has no place in modern economic theory, its long-term behavior provides a strong indication of the changes experienced by the financial sector in the availability of financial products and services and the dramatic changes brought about by the new technologies to make payments. Economizing on M to support the same economic activity has been a constant aim and outcome of technological innovations.

2. *Transaction Costs*

The simplest abstract and aggregated models used by economists assumed that economic agents operated in a frictionless world. There has been increasing interest in transaction costs analysis.^{5f} Transaction costs, like production costs, is a catch-all term for all costs incurred by parties to a transaction — the cost of finding each other, the costs of communicating and exchanging information, the inspection of the goods to be purchased, the drafting of contracts governing agreement between the parties (the timing of the transfer the form and media of payment.) Transaction costs cover all the costs associated with the ownership transfer or, more precisely, property rights.^{6f}

The transaction technology or function specifies the resources required to achieve a transfer: the trading parties' different inputs, the direct and the opportunity costs of the search and transaction time, the difference between buying and selling prices (margins), and other direct (fees to clear a check and obtain good and final funds) and implicit (the float) transaction costs. Analogous to the production function, the transaction function may exhibit diminishing, constant or increasing returns, which has implications for the design, ownership and control of the payment system. For example, in economies of scale competition may not lead to an efficient allocation of resources.

^{4f} *Ibid.*

^{5f} O.E. Williamson's contributions have been important. See "Transaction-cost economics: the governance of contractual relations", *The Journal of Law and Economics*, 1979, 22 (2), pages 233-61, *The Economic Institutions of Capitalism*, 199-.

^{6f} Niehans, Jurg. 1989. "Transaction Costs", *Money*, *The New Palgrave*, Eds. J. Eatwell et. al., McMillan, 1989.

Although transaction costs are analogous to transportation costs, they do not relate to one-way commodity flows, but to two-way (bilateral or multilateral) exchanges in which there is a quid pro quo to the flow of goods in a flow of payments in the opposite direction.

One important outcome of taking transaction costs into account is that it imposes a limit on the economy's gross trading volume. Thus if transaction costs reduce the volume of transactions and welfare, traders will try to minimize transaction costs. The latter provides the theoretical justification for the emergence of more efficient media of exchange (commodity and fiat monies rather than barter) and payment services (payment systems). These reduce the complexity, costs and risks that would otherwise emerge and become prohibitively high in a world of unregulated multi-party transactions. The more transaction costs decline, "the more highly developed will be the division of labor in financial services, the more elaborate the structure of the financial system and the higher the flow of daily transactions compared to the stocks of traded assets. It is tempting, therefore, to interpret the rapid changes in financial markets in recent years largely as a consequence of changing transaction costs".⁷¹ As a result, electronic payment systems increase the speed and accuracy of sending and receiving payment. Thus banks can reduce transaction costs by lowering reserve balances for settlement in relation to the volume of payment processed.

Building and maintaining a payment system is expensive. The benefits of the new credit money supplied must balance against the investments required to support modern systems. The benefits outweigh the costs progressively, de-materializing money from its original physical and metal denomination.⁷²

⁷¹ *Ibid.*

⁷² *Oritani, Y. 1993. "Payment Systems and the Theory of Money," in Payment Systems Worldwide, pages 24-31.*

PAYMENT SYSTEM DEVELOPMENT FOR UKRAINE
REQUIREMENTS FOR CONSULTANT SERVICES

I. BACKGROUND

The recent political, economic and financial changes in the former Soviet Union republics have put significant strains on the payments system in each independent republic. The current payment systems employed were generally designed during the period in which the republics were unified, there was a mono-banking system, the economy was centrally planned and the banks and enterprises were state owned.

The payment system employed, which may have been adequate for the conditions at the time of development, does not readily support the changes that have occurred. There are long delays in making payments, systems and procedures require upgrades and are labor intensive and controls may not be adequate to ensure system integrity.

At the same time, the commercial banks are beginning to plan for new internal systems designed to improve the process of customer accounting and to speed the transfer of customer funds. Such activities must be coordinated between banks to ensure an efficient inter as well as intra-bank payment system.

While the Ukrainian commercial banks and the central bank have started designing payment system improvements, they do not have the full range of internal resources, and more importantly, the experience base to develop a modern payments system to support a free market economy.

In April 1993, a delegation from the National Bank of Ukraine (NBU) visited the German central bank (Bundesbank) and several commercial banks to view their payment system. The German system, which is largely credit based (payment orders) was viewed as a good model on which to base the Ukrainian system. The NBU is currently working on a proposal which would adapt the principals of the German system to the needs of the Ukrainian banking system.

Since the development of a nation's payment system requires significant resources, coordination among all participants/users, and familiarity with existing proven systems, consulting assistance will prove valuable in ensuring a successful implementation in a timely fashion. It is envisioned that the development of the new Ukrainian payment system would be accomplished in two phases. The first phase, which would have a short term orientation, would focus on improving the current system for executing payments between legal entities (businesses) and between banks utilizing credit based payments and relying on currently available technology. The second phase would focus on longer term improvements which would include the introduction of more modern technology (e.g. digital data communications) and would include the introduction of new payment instruments, such as checks, and include third-party payments to be made or received by the private party (consumer) sector.

A National Payments Council (NPC) will be created to ensure coordination between the NBU and the commercial banks in the development and ongoing oversight of the nation's payment system. The consultant(s) providing technical assistance will work closely with this council and its committees in the development of the payment system.

II. OBJECTIVES

The overall objective of the consulting assignment is to assist the Ukrainian banking industry in developing a safe, secure, reliable and cost effective payment system that will meet the needs of businesses, consumers and banks to transfer funds, and help the NBU strengthen macro economic management.

III. PHASE 1 - SHORT TERM IMPROVEMENTS

The Phase 1 effort will be to implement immediate improvements to the Ukrainian payment systems based on the current credit based instruments and using technology readily available in Ukraine. It is expected that the focus of this effort will be on payments made between legal entities (enterprises and businesses) and between banks on their own behalf for money management purposes. It is also expected that this phase will require the implementation of regional clearinghouses; the interconnection of such clearinghouses to provide for nationwide clearing and settlement; and the introduction of a "Large Value" payment system (LVPS) to facilitate the same day transfer of funds between commercial banks through accounts held at the NBU. During this phase, the emphasis will be on making rapid and substantial improvements to the current Ukrainian payment system, but not to attempt to develop the perfect system. The focus will be very much on utilizing available technology within Ukraine, and importing proven techniques and legal and other models from mature payment systems.

The specific tasks to be accomplished during this phase includes the following:

1. *Formalization of the National Payments Council (NPC)*

Specification of the role, organization, composition operation and staffing of the NPC (see sample in Attachment 1).

2. *Clarification of role of NBU in the payment system*

As the nation's central bank, the NBU has ultimate authority for the supervision and regulation of the nation's payment system. Also, as the central bank, the NBU must provide settlement services to banks to ensure a safe method of transferring funds between banks without creating the systemic risk and loss of control over monetary policy that might arise if all settlements were made through bilateral balances held between commercial banks. Notwithstanding the above, an efficient payment system requires the close cooperation between the central bank and the commercial banks; and most developed countries have adopted a system in which both the central bank and commercial banks provide payment processing and correspondent balance services. During this phase, a clear understanding of the respective roles of the NBU, NPC and commercial banks must be established. These roles must give due consideration of the practices of developed countries, provide for prudential supervision of the payment system and promote competition in the provision of payment services between banks and their customers.

3. *Project Plan and Implementation Schedules*

Project plans and implementation schedules, including detailed task lists must be developed to ensure proper project control.

4. *Standardization*

Standards must be developed and approved for paper and electronic transfers in terms of content and format.

5. *Local Clearinghouses*

It is envisioned that local clearinghouses will be used to clear and settle payments made between two banks within the same region. As with most countries' clearinghouses, it is envisioned that settlement for such exchanges will be made through balances held at the central bank based upon multilateral netting. Rules, regulations and procedures for such clearinghouses must be established, including, but not limited to settlement procedures, the legal framework for multilateral netting, local clearinghouse rules, organization, fees, etc. In addition, methods of delivery to and from the local clearinghouse must be defined, including courier and electronic delivery.

6. *National Clearinghouse*

As with local clearinghouses, rules, settlement, delivery and other organizational, legal and operational considerations must be defined. During this phase the goal is to interconnect the local clearinghouses so as to significantly improve the speed and reliability of nationwide clearing. It is envisioned that a three day maximum clearing period will be adequate for this first phase. Given the limitations of telecommunications within Ukraine, it is expected that a combination of physical and electronic interconnections between clearinghouses will be most cost effective.

7. *Rationalization of Correspondent Account Maintenance*

The NBU currently requires that each commercial bank branch maintains its correspondent (clearing) account balance at its local office of the NBU (26 regions). In addition, each bank must maintain a separate reserve account with the NBU. The current system makes commercial bank account maintenance and settlement somewhat difficult. The NBU account management process should be reviewed for opportunities to improve operations and facilitate efficient account maintenance at both the NBU and commercial banks. This may imply eventual centralization of a commercial bank's correspondent account at a single NBU office, improved intra day balance reporting and/or consolidation of reserve and clearing accounts. In addition, procedures for net settlement accounting and for maintaining bilateral correspondent accounts between commercial banks must be developed and/or refined.

8. *Large Value Payment System*

As part of improved NBU account maintenance, commercial banks need a mechanism for the same day transfer of funds. In addition, certain time critical, usually high value payments may require same day clearing and settlement. In most developed countries, the central bank provides the capability for such same day settlement services. In the short term, the demand for such services is likely to be low, permitting a system with both manual (telephonic) and electronic notice for optimal cost efficiency and rapid implementation. However, given the large value of each payment that is likely, credit and other risk control procedures must be of the highest integrity.

9. *Legal and Regulatory Framework*

In addition to developing and adopting a legal and regulatory framework for electronic advice of transfers and multilateral netting, a legal/regulatory framework must exist which defines the rights and responsibilities of all parties to the payment transactions, including the payee; payor, paying bank, collecting bank, and intermediate clearing and settlement agents. In addition, error resolution, finality of payment and other provisions must be clearly delineated. If necessary, regulations authorizing the NBU to regulate the nation's payment system and serve as settlement agent must also be developed. In undertaking this task, the consultant should review the existing Ukrainian legal and regulatory framework, and, as necessary, recommend enhancements based upon existing models in other countries with mature payment systems. The consultant is not expected to draft the legal and regulatory framework, but should assist in determining if the current framework is adequate, and if not, recommend remedial actions.

10. *Security and Control*

The system must be designed with appropriate consideration to security and control requirements of a system which transfers large sums of money on a daily basis. This includes controls against unauthorized access or alteration and may require positive acknowledgement of payment messages, data encryption, access passwords, financial control records, etc.

11. *Consistency with intra-bank system plans*

The Ukrainian banks are beginning to develop and implement plans for the automation of their branch networks. Inter-bank clearing and settlement plans must take into account the activities of commercial banks in automating their networks, as must commercial banks be aware of the requirements to interface with the inter-bank clearing and settlement network. Such factors must also be taken into account in the subsequent phase of the assignment.

12. *Accounting and Control*

It must be verified that proposed procedures for the accounting of clearing and settlement transactions conform with generally accepted accounting principles and that financial and other controls are adequate to ensure system integrity.

IV. PHASE II LONG TERM IMPROVEMENTS

This phase will define the longer term payment system for Ukraine, and will enhance and broaden the system developed during Phase 1. It is expected that this phase will include the addition of other payment instruments, such as the check and instruments that will be usable within the private party (consumer) sector. In addition, this phase will incorporate modern telecommunication and computing technologies to improve the speed, reliability, convenience and cost effectiveness of the nation's payment system. However, recognizing the limited financial and human resources available and likely to be available in Ukraine, the system defined must take into account the timing and cost for readily available technology and should not require a massive investment in a technological infrastructure solely to support the payment system.

This phase of the project is expected to include a visitation program to one or two countries (e.g., USA,

England, Switzerland) to enable key Ukrainian payment system decision makers to enhance their first hand knowledge of other payment system instruments and models. Such a visitation program is expected to commence at the beginning of this phase.

The scope of the work for this phase is described below.

1. *Needs Assessment*

The end user (enterprises, businesses and, to a lesser extent consumer) needs for payment convenience, security, reliability and cost effectiveness must be determined. The system design must be market driven, which begins with an assessment of user needs. As businesses are privatized, the volumes and service level needs are expected to grow.

2. *Payment Instrument Design*

Each developed country employs a variety of payment instruments to satisfy the diverse needs of the consumer, business and inter-bank payment markets. The development team must design the proposed payment instrument set that is broad enough to meet the needs, but not so broad as to be operationally inefficient. The instrument set may include:

- Debit and/or credit based instruments
- Electronic paper and/or card based instruments
- Batched and/or on-line based instruments.

3. *Clearing and Settlement Systems*

As with payment instruments, the clearing and settlement options are vast and include:

- Clearinghouse, correspondent and/or central bank clearings
- Gross, multilateral and/or bilateral settlement
- Daylight, overnight and or collateralized overdraft controls
- Central Bank and/or commercial correspondent bank settlement
- Provisional or final settlement and timing/terms of finality.

Proposals for clearing and settlement must take into account the unique payment flows and banking structure within Ukraine as well as the systems implemented during the first phase.

4. *Standards*

Payment instrument standards must be developed to ensure inter-bank and, ideally, even interrepublic compatibility. Standards include such issues as bank and customer account numbering structures, machine readable technique (e.g., OCR, MICR) and formats, electronic formats and interface standards, card based (e.g. magnetic stripe) standards, hours of operation, timing of entries, etc. Ideally, standards should be based upon approved international standards that have proven viable in other countries.

5. *Technological Infrastructure*

A technological infrastructure, including telecommunications, computers and special purpose

devices such as check reader sorters and software must be defined and selected from vendors.

6. *Legal and Regulatory*

The legal and regulatory framework developed in Phase 1 must be broadened as necessary to incorporate new instruments and end users. Such a framework is necessary to gain the confidence of the users in order to promote appropriate usage of the instruments. The consultant is not expected to draft the legal and regulatory framework, but should assist in determining whether the current framework is adequate, and if not, recommend remedial actions.

7. *Safety and Security*

The system definition must ensure that the significant risks inherent in systems that transfer large sums of money are properly addressed. Risk control procedures must cover credit risk, fraud risk, risk of unauthorized access and risk of delays due to system outages.

8. *Ownership and Control*

Issues such as the ownership and control of the system(s) must be defined. These options include NBU ownership, single commercial bank ownership and/or joint ownership. In addition to who owns the system(s), the control of rule making, procedural changes, access to the system, etc. must be defined.

9. *Cost Efficiency and Recovery*

It is necessary that the system be cost efficient and the method by which capital and operating cost recovery for the system be defined. Options for cost recovery can include cost sharing techniques, per item charges, equity ownership contributions, initial subsidies (if necessary) to promote use with longer term recovery, etc. Joint ownership can be on a break-even or for profit basis, with fees set accordingly. In the final analysis, if the system is cost efficient, it should be possible to recover its costs through user fees. If the system is not cost effective, either through over engineering or lack of market responsiveness, it will be impossible to fully recover costs over the long run.

10. *Intra-bank Design*

The inter-bank system must be fed by and feed into each bank's intra-bank system. For example, if the banks develop their own intra-bank clearing and communications systems, the inter-bank system will have less volume and significantly less communication demands. During the inter-bank development phase it will be necessary to also work with the large commercial banks to develop and refine internal plans based upon inter-bank considerations.

11. *Project Plan and Implementation Schedule*

The consultant must assist in the development of a realistic and detailed project work plan and implementation schedule.

V. RESOURCES TO BE PROVIDED BY UKRAINIAN BANKS

It is envisioned that a payment system project team will be created to undertake the project under the direction on the NPC. The consultant is expected to work closely with internal Ukrainian resources to provide project management and payment system technical expertise. A full time project team of 5-10 persons from Ukraine plus part time assistance via the NPC committee structure is expected to support the technical advisor.

VI. CONSULTING SERVICES REQUIRED

The project team will have primary responsibility for the development of the payment system design. The consultant will be expected to work as a member of the team and guide its efforts toward a viable solution.

As such, the consultant is expected to provide a practical knowledge of effective payment systems in more economically advanced countries with particular emphasis on Germany, as well as experience in designing payments systems in emerging countries. The consultant(s) must possess knowledge of all forms of payment systems including:

- Debit and credit based systems
- Paper and electronic systems
- Consumer, business and high value payment transfer systems
- Legal and regulatory requirements
- Custom deposit accounting systems.

In addition, the consultant must have demonstrated skills in the management of large scale implementation projects.

VII. TIME SCHEDULE

The project is expected to begin in the spring or early Summer of 1993. The preliminary schedule for the first phase calls for implementation of the payment system improvements by year end 199_ as follows:

- Local clearing house implementation Month
- Interconnection of local clearinghouses Month
- Large value payment system Month

The consultant must be prepared to be on-site for much of this time.

The second phase is expected to commence immediately following the completion of phase I and is expected to last 6 - 9 months. During this phase, the it is not expected that the consultant need be on site full time, but will be required to provide periodic direction and advice to the Ukrainian project team.

VIII. DELIVERABLES

The consultant, working with the Ukrainian project team is expected to produce the following

deliverables:

Phase I

- A recommended set of improvements to the existing payment system in the Ukraine
- The implementation of significant enhancements to the current payment system in Ukraine
- The consultant will report monthly to the NPC Board of directors and the World Bank

Phase II

- A description of the payment instruments to be used
- A description of the systems and procedures to be used for processing, clearing and settling each payment type
- An implementation plan for each payment system, including:
 - Hardware, software and telecommunications required
 - Legal and regulatory framework required to govern the payments
 - Clearing and settlement procedures required

IX. CONSULTANT QUALIFICATIONS

The consultant must have broad experience in payment system development and design on both the retail and wholesale level. The consultant must also be expert in commercial bank accounting procedures and systems and knowledgeable of central bank activities and payment system legal and regulatory issues.

The consultant must have worked on payment system matters in multiple countries, ideally in both mature and developing economies with particular emphasis on Germany. Familiarity with payment systems hardware and software is required, but payment system business planning, commercial and central banking and project management experience and skills are of greater importance than technical skills.

The consultant must be able to have one or more staff members assigned on-site for the majority of the project duration with the requisite qualifications and experience. The consultant should arrange for all services required under this project, although subcontractor arrangements may be entered into for the provision of certain specialized services (e.g. legal and regulatory matters). If this is done, the consultant will supervise and be responsible for the adequacy of such services. A knowledge of Russian and/or Ukrainian is, obviously, a plus, but interpreters will be available to resolve the communication problem.

PAYMENT SYSTEMS IN FSRs

BACKGROUND

To fully understand the current state of payment systems in most FSRs, it is important to review their historical roots. From 1930 until the recent reforms, a single, monobanking system served the entire Soviet Union. The Soviet Central Bank (Gosbank) conducted all commercial banking. A state-owned Savings Bank, working with the Central Bank, served as the single consumer bank, and provided individuals and households with savings deposit accounts. The Savings Bank did not lend to the consumers or businesses. Funds generated from consumer deposits were made available to the Central Bank. The Central Bank loaned the funds to businesses, all of which were state or collectively owned, either directly or (by sector) specialized banks.

Because the Soviet Union operated a monobanking system and owned all enterprises, payment transactions were made through intra-bank transfers and intra-company transfers. The payment system served as an inter-branch, intra-bank settlement system (MFO). Because payments were made through intra-bank transfers, control was the system's principal design feature, rather than speed, convenience or reliability.

Payments were effected by making accounting entries drawn from the data contained on multi-part forms sent between customers (clients), territorial central bank branches and the Central Bank's regional computer processing centers. Payment instructions taken from the forms were transmitted electronically between computer centers to generate inter-branch accounting entries. The paper forms were sent by mail between the payer and the payee's territorial central bank branches to serve as the basis for the customer accounting entries. The entries made in the computer centers were reconciled periodically with the separate entries made from the paper flow at the central bank territorial offices to provide a form of dual control to ensure against fraudulent entries or processing errors.

Enterprise payment transactions were made almost exclusively by intra-bank accounting entries. These transactions were called "cashless" payments because no currency was used in the transaction. Consumers without access to bank transaction accounts made all their payments in cash. The currency in circulation was easily controlled by the separation between cash and cashless payments.

CHANGES IN SOVIET REFORMS

Several changes lead to the disintegration of the Soviet payment system (MFO). The monobanking system, eliminated in the late 1980s, changed to a two-tiered banking system of several state-owned, nationwide specialized banks. The new banks served specific economic sectors (agro-industry, industry and construction, construction and investment in the social sectors, and export-imports.) The commercial banks were created by assigning branches and personnel from the central bank, which maintained a large network of territorial offices to provide local functions (cash distribution) and held correspondent (clearing) accounts for each local branch of a specialized bank.

The second change was the breakup of the former Soviet Union into 15 separate republics. The breakup created 15 separate central banks initially, and 15 sets of specialized banks and savings banks. During the breakup, most of the credit resources remained in the Russian Federation, draining funds from the

banking systems in the other republics. Many managerial and technical resources remained in Russia where the major decision making apparatus of the former Soviet Central Bank was housed. Commercial banks paid much higher wages than central banks, further complicating the human resource problem. Many important people departed, and experienced bank staff for the central banks was scarce.

A third change was the creation of national currencies in the new republics. Until recently, the national currency was used for cash transactions only. Cashless (inter-enterprise) transactions (domestic and cross border to former Soviet republics) continued to be made in rubles. Later the new republics adopted national currencies for all domestic payments.

The final change was the further restructuring of the banking industry including chartering many new "private" banks. There are hundreds in the Ukraine and thousands in the Russian Federation. Most banks are small, with only one or a few banking offices, and many carry out limited banking functions. However, some are full service commercial banks whose share of the market, while still small, is growing at the expense of the state banks. Along with the new banks, the specialized banks are moving to joint stock ownership.

OVERVIEW OF CURRENT PAYMENT SYSTEM ISSUES

The massive changes in the political, economic and banking systems during those few short years rendered the payment system ill suited to the new environment. Remnants of the former MFO system are still used, such as inter- and intra-bank payments and payments between republics. However, the lack of human, technical and financial resources have lead to severe delays and breakdown in controls. For example, cross border currency controls between Russia and other FSRs have blocked many payment transfers. Because of close economic ties between the republics (fostered by former Soviet policies to spread enterprises among republics), cross border payments make up the large share of cashless payment transactions.

The current payment systems in most FSRs are inadequate (at best) and cannot support the commercial needs of free market economies. The Central Banks created several new departments to address these problems, such as the Computer Center Department and the Payment Methodology Department. Although the staff are highly competent and energetic, they are inexperienced in free market payment systems and require more experience, training and guidance to develop sound payment system strategies. Bankers Associations have been created, but they lack experience in payment systems and have many competing priorities. Most of the initiatives for reform come from the large commercial banks looking to improve intra-bank systems to compete for market share. The uncoordinated activities could lead to inter-bank payments integration problems.

PAYMENT SYSTEM PROBLEMS

Delay in the cashless payment system. Intra-bank and inter-bank payments may take as long as one to two weeks if the payer and payee's banks are in different regions because the banks rely on the postal service to transport paper documents. Payments can be made by cable in two to three days, but are expensive and reserved for large payments. However, the postal service is not responsible for all the delay. Payments going across the street are said to take about three days. Payment delays increase the level of float, therefore, scarce financial resources must be devoted to the payment system. Most of the float's cost is borne by businesses rather than banks. Most payments are credit payments in which payer

debiting occurs before payee crediting. The banks profit from the float, and have no real incentives improving customer services speeding up credit payments. To combat this problem, regulations have been passed providing penalties for payment delays. It is unclear whether these regulations are enforced or if they are enforceable. Many payment delays are caused by cross border payment blockages imposed by Russia. Although this issue must be addressed, it is a political and economic problem, not a payment system problem per se.

Inefficiency in payment operations processing. To provide tight controls, each transaction is presented twice, by manually sorting and transporting the original paper document, and by manually entering the document data for electronic transmission. The customer entries are based on the receipt of the physical document and the electronic notification is used only for control. This process could be streamlined by using machine-readable documents, and passing regulations that would legalize electronic transfers. Laws governing electronic entries do not exist in most FSRs. Compounding the processing problem is the banking system's lack of automation and telecommunications facilities.

Payment system risk and managing balances for settlement. The central bank and the commercial banks lack real time information to employ efficient cash management practices. The increased use of correspondent balances held between commercial banks increases systemic risk and suggests that Central Bank as settlement agent is inefficient.¹¹ Most payments must flow through the Central Banks. Competition is healthy and tends to promote efficiencies. In a system where the Central Bank competes in the payment arena, regulations should not favor the Central Bank. Nonetheless, the Central Bank must be able to guard the payment system from risks. Competition should be based on transaction processing and payment services, not on settlement alone, because the Central Bank has a natural desirable operational and risk advantage. Each bank, including the Central Bank, must review its internal account management and intra-branch systems. Improved settlement techniques, such as local clearinghouses with Central Bank net settlement, will reduce the Central Bank settlement bottleneck created by the gross settlement system now employed.

Independent automation paths for internal systems designs. Consistent integrated solutions for the national (and perhaps international) payment systems will avoid incompatibly and wasted investment. Speed is important as individual banks, recognizing the importance of automation to attract customers, are developing their internal systems rapidly.

A time critical system for transferring inter-bank payments. Real time account management is of little value if the system has no means to correct cash management. This requires the development of an active domestic money market and a real time system for adjusting account positions in the central or commercial correspondent accounts. Before this can be done, banks need to re-examine the entire structure for holding settlement (correspondent) balances. The maintenance of correspondent accounts at the branch or the territorial level decreases the effectiveness of aggregate balances held and makes cash management difficult and costly. Strong consideration should be given to moving toward a single nationwide clearing account for each branch, perhaps with intermediate accounts at the territorial level. Furthermore, consideration should be given to combining the reserve and clearing accounts to provide better intra-day liquidity, or paying interest on reserves or correspondent accounts to minimize the incentives to manage such accounts with as low a level as possible. With high inflation banks have

¹¹ *The risks are real because the banks are under-capitalized and weakly supervised. Some may have highly concentrated loan portfolios and high lending levels. The economic environment is highly uncertain. Economic adjustment will probably result in enterprise closures and bankruptcies. It is unclear whether the state will provide banks with protection in such cases.*

disproportional incentives to minimize the holding of non-interest-bearing deposits used for settlement at the expense of overdrafts and credit risk at the Central Bank.

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