

use. The check clearing system is not well developed and there is no central clearing institution.

**(2) Retail Settlements by Means of Credit Cards**

Credit cards and prepaid cards do not now exist in Kyrgyz. Point-of-sales (POS) systems at retailers or at banks have not been introduced. Some of the more advanced banks (such as Kyrgystan Bank) as well as retailers and software development companies have studied the use of credit cards.

**(3) Electronic Banking, Including Home Banking**

There have been no efforts to date in Kyrgyz to introduce electronic banking such as home banking.

**(4) Securities Payment system**

The only government securities issued in Kyrgyz are 3-month Treasury bills. Starting in May 1993, the bills have been sold by auction. Commercial banks participate in the auctions, that are held weekly, but because there is low confidence in government securities and the banks do not have a great amount of funds with which to buy the bills, participation in the auctions has been at a low level.

There are no securities that have been registered for book-entry management, and there is no payment system in place for marketable securities.

**5-4 Current Situation on the Computer Systems for Payment System**

**5-4-1 Current Situation on the Computerized Payment System**

**5-4-1-1 Overview**

As mentioned in the previous chapter, a computerized payment system is in operation in the two regions – Chui and Osh. Two Computer Centers (CCs) in those regions are providing data processing services for the head and branch offices of the commercial banks. The systems cover both inter- and intra-bank payment as well as customer transfers. Head and branch offices of the commercial banks are acting as

individual users in this system. They are transmitting their original data to the CC through their own transmission equipment (PCs with modems, etc.) and receiving the result which were processed in the CC by individual basis.

When customer transfer is made by a client to his/her payee using both accounts with the banks' offices in Chui region, the CC in Bishkek performs data processing by debiting both payer's account and the settlement account of his bank, and crediting the payee's account and the settlement account of the receiving bank. After completing these processes, payment instructions are transmitted to the receiving bank. If the receiving bank is out of coverage, the CC processes sender's accounts only.

Fifty-one users, including the head and branch offices of the commercial banks, are sending data to and receiving results from CC in Bishkek using either tele-typewriters, PCs with communication programs, or paper documents produced by the tellers.

The facility and equipment of CC in Bishkek are very old, rather obsolete, and the renewal of their computer system is expected in a short period.

#### **5-4-1-2 Technical Aspects**

The computerized payment system can be divided into three functions:

- Local user interface for producing original payment data at each user's site
- Data transmission facility to present payment data to the clearing or settlement body
- Data processing for netting and settlement, in order to maintain the position and the balance at each bank

In the country, these functions are being performed as:

- Local user interface performed in either in-house systems or by tele-typewriter at each head or branch office
- Data transmission by telex, and data switching services by Rashotonaya Parata (RP) and the Automation Department in NBK
- Among data processing, settlement is done at the CCs, but netting is not performed on the computers.

Figure 5-9 shows the outline of these facilities.

Following are detailed reports by in-house systems, switching services, and CC of NBK in Bishkek with both telex and data processing.

#### **5-4-1-3 Computer Systems in the Financial Institutions**

##### **(1) In-house systems in commercial banks**

Most commercial banks use their own in-house systems for their daily operation, and some banks are currently upgrading their present systems. All of the commercial banks are using single-task systems to perform their banking operations. In this system, payment orders are input using specially designed programs. Many systems are running on stand-alone PCs and some are running on locally connected PCs and LAN systems. In either case, the only way of connection to the external systems is a batch-mode file transfer via telephone circuits. These connections are on an off-line basis because of the insufficient capacity of communication circuits. No on-line connection is available among commercial banks and their branch offices in these circumstances. In other words, both intra- and inter-bank system based on the on-line systems are not yet established in the country. There are several reasons for this:

- Historical aspects: the country's system emerged from a mono-bank strategy without competition
- Level of computerization, on the old computers at the CC of NBK or in-house system on PCs as above - Lack of service mind-set for providing quick services
- Low availability of the communication facilities
- Independence of branch offices
- Lack of need for remote on-line services

Under the strategy for transferring market-driven services from fully controlled way of services, some banks are on the way to renew their in-house systems. What they are trying in upgrading and replacing their in-house systems is to introduce new remote systems and host systems to cover all their business transactions. This means that their systems have the potential to perform intra-bank funds transfer and settlement for customers among their offices.

However, most banks are still staying in their current positions, either depending on their own stand-alone PCs, or services which are provided by the CC of NBK. These banks are not in a position to operate their own intra-bank payment system by themselves due to their communication services, personnel problems, accounting procedures, and so on. Technical assistance, time, and both internal and external funding may be necessary to develop in-house systems which will be able to control their intra-bank transactions.

(2) Switching services by NBK and Rashotonaya Parata (RP)

There are two data switching services being provided to the financial institutions in the country. The Automation Department of NBK is intending to provide data transfer services to all commercial banks. With this service, the commercial banks and their offices have the capability to transmit payment data.

The other switching service, provided by RP, is used by its participants to transmit actual payment data together with other business data, to the CC of NBK. The CC of NBK performs fund transfers with these data.

1) Switching at NBK

The Automation Department of NBK is providing one of their PCs as a switching device for file transfers among commercial banks. Major information transmitted in this PC includes:

- End-of-Day balances of general ledger accounts
- Foreign exchange transactions

The functions of the service in NBK are:

- To accept calls from any bank via two telephone lines
- To receive file transfers from banks and branch office
- To keep files which are transmitted to them in the disk storage
- To accept calls from other banks and branch offices
- To send files upon request of banks and branch offices

Although these services are to provide general purpose transfer for any type of data between NBK and banks/offices, some problems exist:

- PCs using the DOS platform offer no protection of the systems, and have a low level of security
- Telephone lines for dialing are low level in terms of availability and reliability of data transmission
- Neither auditing nor security checking is performed during operation

These are the problems that need to be solved in the new payment system involving the JICA Study Team during the study mission.

## 2) Switching at RP

The switching system at RP exists as a gateway to the participants of RP and some branch offices of major three large banks, in order to send or to receive data to and from the CC of NBK in Bishkek. General procedures of this service are:

- Members send their payment data to RP, using file transfer function of their PCs at their offices.
- After collection of these data, RP unloads data to diskettes and sends them to the CC
- CC processes the data together with the data from other sources, and sends the result back to RP in the diskettes
- RP loads the data from diskettes to PC, and waits for connection from the members
- Members connect their PCs to the RP and request downloading of those the results back to their systems

These services provided by RP have problems similar to those provided by the Automation Department of NBK, described in the previous section.

(3) Settlement at the Computer Center of NBK

Payment systems are computerized facilitating both inter- and intra-bank settlement in the NBK two computer centers, (one in Bishkek and the other one in Osh).

1) Services at Bishkek CC

In this computer center, 52 head and branch offices of commercial banks, mainly located in Chui region, are receiving data processing services. The services provided here are:

- Collecting payment orders from the payers' branch offices
- Debiting payers' deposit accounts, if specified by the customer bank
- Debiting settlement accounts of payers' branch offices
- Crediting settlement accounts of payees' branch offices, if those branch offices are the participants of the CC
- Crediting payees' deposit accounts, if specified
- Sending lists of proof to the payers' branch offices
- Sending payment advice to payees' branch offices, if the branch offices are participants of the CC

Daily schedules at Bishkek CC are:

- 10:00 to 16:00, data collection service taken in via one of three access methods; i.e., telex lines, switching at RP, or paper documents handled by courier services
- 16:00 to 18:00, spare time for data collection. Banks and their branch offices can send additional data on a request basis
- 18:00 to 2:00 of the next day, data processing and outputting the data
- 6:00 to 8:00 A.M. of the same day, delivery of hard copy output by hard copy via courier services

There are no scheduled jobs on Saturdays and Sundays in the CC. The average number of transaction records handled in the CC per annum, when looking at historical order were:

- 8,860,700 in '89
- 4,700,700 in '90
- 4,948,400 in '91
- 3,953,300 in '92
- 2,997,200 in '93

The total number of data processing services have decreased 34% in five years. There are mainly two reasons for this; and they are related to economic factors and the quality of information services'.

- Some participants are no longer satisfied with the contents of the services provided from the CC. The needs for the services seem to have drastically changed during '90. To meet the latest of data processing needs, the CC should organize the marketing and planning section to renew their services
- Old hardware and software (This will be reported later.)
- Introducing in-house systems which enable the commercial banks to perform their own data processing in-house

## 2) Access method to the Bishkek CC

There are three types of access to the computer center.

- Access via Telex lines, using tele-typewriters
- Access through data switching system at RP
- Access by bringing hard copy

Figure 5-10 shows the overview of sending data to the CC, and Figure 5-11 shows the results of data receipt from the CC.

Following are the details of each access method.

### (A) Telex access

The head and branch offices of the commercial banks who own telex terminals or tele-typewriters can send their transaction data at any time during service hours for data collection. The CC simply receives the data as a set of characters and stores it in its auxiliary memory

devices. The CC has enough capacity of line concentrator to receive data from the banks and branch offices. The users, head and branch offices of the commercial banks, also receive the results of data processing using those tele-typewriters. For the offices of the commercial banks, tele-typewriters are remote key-to-disk machines with remote printers. This system has the following advantages:

- High reliability of data transmission by telex communication protocol
- High availability in connecting users' telex facilities to the CC
- Unaccompanied print-out available at the users' sites
- For the payment orders among participant offices, both customer transfer and settlement finish in the CC by next morning.
- Relatively easy process for establishing standards such as data codes and the documents formats, due to the single system which used by all the participants

However, this system also has the following disadvantages:

- Low transmission rate, typically 50 bps in telex services. This results in a small capacity of data transmission among commercial banks and the CC
- No data validation checking on the tele-typewriter. Since this equipment is the same as a simple typewriter, there is no validation checking performed while key typing.
- Uncleared result of validation checking in transmitting data. No error indication is given by the CC communication system during data transmission. Clear error indication will save the users on the time of transmission.

These disadvantages will be the major concern of those in charge of designing new communication methods for the payment system.

**(B) Access through the data switching system at RP**

This was reported at the switching systems.



(C) Access by bringing paper documents

The last way of access to the CC is bringing paper documents to be converted to electronic data by CC personnel. All the participants who do not have tele-typewriter or PC must bring their documents either by themselves or using courier services. Those documents are put on the shelves by the entrance of CC, and are typed by the staff of the data entry section into tape devices using special equipment for key-to-tape conversion.

The result of data processing by the host systems of CC are given as print-outs on the paper. The print-outs are put on the shelves by the addressee, and are picked up by the courier services for delivery to each addressee on the morning of the next day.

3) Operation at the Bishkek CC

The operation procedure at the Bishkek CC is:

- (A) During the daytime, data collection service via the telex lines is provided using special equipment called 'telex line concentrator' that is controlled by the front-end system. Two computer systems are assigned for data collection, one is the live system and the other one is used for the back up.
- (B) After closing telex communication at 16:00, data stored in the front-end system are unloaded to a magnetic tape device that is used to exchange data between the front system and the host system. Together with the data that are collected by the PC file transfer through RP and by key-to-tape facilities at data entry section of CC, those data are sent to the host system before starting its processing.
- (C) At 18:00, the host system starts data processing, and then produces output as the result of the processing on either printouts or magnetic tape devices. Two types of magnetic tapes are produced due to the distribution methods of the output.
- (D) Print-outs are put on the shelves at the entrance of the CC, one of the magnetic tapes is sent to the front-end system to send the output via

telex lines, and the other tape is converted to diskettes for the transmission from RP to its participants.

- (E) If data correction is urgently required, staff can make input punch cards with the corrected data via a card reader.

4) **Organization of the Bishkek CC**

The Bishkek CC has six departments:

- Administration
- Technical services
- Operations
- Data entry and correction
- Inter-bank settlement
- After-services

Among these organization, software maintenance, new programming, hardware maintenance, data entry and systems operation are being performed. However two functions seem to be missing:

- Customer services, in order to maintain customer relationships between commercial banks and CC
- Planning, in order to make and check systems development and maintenance planning to keep a high level of services

With these responsibilities, the CC will be able to satisfy the commercial banks and their branch offices as their clients.

**5-4-2 Hardware and Software in Use**

**5-4-2-1 In-house Systems**

(1) **Hardware**

Commercial banks and NBK are highly dependent on PCs for their data processing operations. Most of their hardware is based on AT-compatible architecture with MS-DOS as the basic operating system.

The specifications of this hardware are:

- CPU by Intel, either i286, i386, or i486
- Sixteen-bit and eight-bit ISA busses with AMI BIOS
- Up to 8 Mega-byte (MB) main memory
- Up to 330 MB hard disk, IDE type
- Two diskette drives, 3.5" type and 5.25" type
- VGA or SVGA video card, with monochrome or color monitor
- IDE adapters with 1 parallel, 2 serial, and 1 game port, at maximum
- 110/220V, 6A power unit

The high-end models available here are either Intel Pentium or i486 DX2/66MHz processors, which are new here. Most of their PCs are of older models with either i386 or i286 processors. Table 5-8 shows the number of PCs used in NBK, and Table 5-9 shows the number used in one of the large banks with 27 branch offices. As in these tables, low-end models with 1 MB memory are the most commonly used. According to the estimate, there are approximately 300 PCs used by the banks, classified as:

- 60% of i286 or older models
- 35% of i386 models
- 5% of i486 models

As is seen in Table 5-10, i286 or older models are not powerful enough for business operations with the latest application programs used in some commercial banks.

## (2) Software

There are two types of software used in the financial institutions here, development software and the application software. The application software is used for business operation, and the development software is for producing application software.

## 1) Development software

Programming is being done mainly using database products on the PCs such as FOX BASE, FOX PRO, and CLIPPER. As for as the data volume is concerned, these products seem to be adequate to produce application programs and to operate on the PCs. Payment records may easily be collected by copying data from these application systems for the transmission to the clearing or settlement organization and execution of settlement processes. Some development staffs of the banks have started programming languages such as C, PASCAL, or BASIC. Now is the time to start programming with C for developing both the basic software and the application software, in order to build and maintain computer networks and other parts of the payment system.

## 2) Application software

Many banks are using a bundled software which is specializes in banking operation, named 'Operation Day of Bank', and developed in either Bishkek, Kiev, or Moscow. This software runs on DOS PC with 1 MB main memory and 10 MB or more disk storage. There are several versions of this software, and a locally customized version is available in Bishkek. Almost all the local banking operations here are covered by this software. The detailed functions of 'Operation Day of Bank' are shown on the Table 5-11.

Application system for the operation at the headquarters of the commercial banks is not clearly seen in the financial institutions here. In order to introduce payment system over the country, the role of the host system is very important. The minimum requirements for the host system are:

- To keep the consolidated balance of the general ledger for the whole bank
- To maintain office accounts for the intra-bank transfer
- To maintain the balances at off-balance transactions for the required operation such as foreign exchange revaluation
- To keep the necessary data for the central bank reporting

#### **5-4-2-2 Switching Systems**

##### **(1) Hardware**

AT-compatible PCs are used for both switching systems at NBK and RP. The specification of these PCs is:

- CPU with Intel 386/33 MHz chip
- AT compatible data busses
- 4 MB main memory
- 120 MB disk storage
- Two V42/bis 2,400 bps modems

This configuration seems a little small for a PC system that provides switching services to approximately 20 banks with 170 branch offices in total.

Consideration of the network configuration is necessary. Due to the small capacity of the inter-city telephone station in Bishkek, a computer network must be designed carefully in order to manage both inter- and intra-bank payment messages among banks and their branch offices.

##### **(2) Software**

A bundled software in MS-DOS is used for these services. It is named 'TLX315'. This software is designed to perform file transfers by transmitting the data in batch mode. It does not seem to fit the message transfer services used by payment networks in other countries such as SWIFT, CHIPS, or Zengin. Transmission by single message is more useful for large networks with a large volume of data transmission.

Arrangement of data transmission in both batch and transaction mode is highly recommended for the design of the computer network for the payment system.

#### **5-4-2-3 Bishkek CC**

There are four types of hardware equipment in the CC of NBK in Bishkek:

- Host system to perform data processing

- Front-end system for the data collection via telex interfaces
- Key-to-tape entry systems to type paper documents into magnetic tapes
- Device conversion systems between diskettes and magnetic tapes

(1) Host system

1) Hardware

Two systems of the M5100 model are working as the host system for data processing. Each system has the following configuration:

- 64 KB main memory
- Three removable cartridge disk drives, with the total capacity of 25 MB
- Three magnetic tape drives
- Two card readers
- Two fast printers

The hardware of this system is very old, delivered in '60s. This results in the following disadvantages:

- Support from the manufacture seems to have terminated. If so, the CC has to keep both spare parts and personnel for technical services, which increases operation costs.
- Services personnel are always required to be on hand for technical services. The older the system is, the more cases his/her services are requested. If the services are required as many as once a week or more, the operation of payment system using such computer systems may be said to be in a dangerous condition.

2) Software

The major functions of the host systems are:

- To maintain the balances of the accounts of the commercial banks and their branch offices
- To output the processing to three types of devices: a magnetic tape for the transmission via telex lines, another magnetic tape for the

transmission through the switching system at RP, and a print-out on paper.

The application programs for these functions are written in assembler language, which requires great effort to develop and maintain. The initial software for this computer system came from Moscow, when NBK was one of the branch offices of Gosbank. Now it is being maintained locally.

No middle-ware products such as transaction processing monitors or communication programs are used.

Due to the small configuration and assembler language, it takes long time to update the programs. Renewal of these computer systems in a short time is highly recommended.

## (2) Telex front-end system

The front-end system for telex communication is designed to collect data from and to distribute the result to the banks and their branch offices via telex lines. The hardware for this system has a special peripheral equipment for concentrating telex lines. The model of this hardware is SM 1600, which is as old as the host system. The configuration is:

- Main memory – unknown
- Dual disk storage system
- One magnetic tape drive
- Multiplexer to control the line concentrator

One of two sets of the hardware is acting as the live system, and the other as the stand-by back up system. The software for this system is also written in assembler language.

This system also has problems similar to the host system such as obsolescence and running cost.

**(3) Data entry system**

There are five or six special devices to convert key strokes to magnetic tapes. These equipment are used to prepare input data from the paper documents, for the processing by the host system. The operation is entirely on an off-line basis where no validation checking is performed.

**(4) Device conversion system**

As mentioned in the section for the switching system at RP, this system is used to convert diskette devices, which are produced at RP with the data from its participants, to magnetic tape devices. This system is specific to this center, as the host system does not have any diskette drives.

**5-4-2-4 Osh CC**

The JICA Study Team heard that CC of NBK in Osh is providing services similar to as Bishkek CC. Their hardware is SM 1600, the same as the telex front-end system at Bishkek CC. The software came from Etuania.

**5-4-2-5 Issues and Problems**

**(1) Local systems of the commercial banks and their offices**

As mentioned in the section for the application software of in-house system, 60% of PCs in the financial institutions do not have enough configuration to run 'Operation Day of Bank' for the banking operation. In addition, the PCs in local offices may be required to adopt additional functions for the payment system. Even the smallest offices may need the PCs as big as powerful as the i486 model with 4 MB main memory and 120 MB disk storage. The branch offices with the largest volume of transactions may need a combination of PCs connected together in an LAN.



## **(2) Switching system**

Several disadvantages are found on the hardware and basic software used in the switching systems. These mainly came from MS-DOS platform used for the major business operations:

- Unprotected system against application programs. This results in unexpected crash of the system as well as destruction by computer virus.
- No security control on the public data
- No functions to classify and to check the users
- No capability for multi-tasking to perform concurrent multiprocessing, which is necessary for multi-user operation
- Small capacity for accepting frequent requests from a large number of users

As the data volume, together with the number of users, increases on the switching network, the construction of a network with multi-client, multi-application, multi-format, multi-equipment and multi-platform will be necessary.

## **(3) Computer Center**

There are many problems caused by the old systems at CC of NBK. As mentioned in this section, the hardware of CC is too old to operate and to maintain. Redesigning these systems in a short time is highly recommended.

### **5-4-3 Current Situation on the Users' Environment**

#### **5-4-3-1 Organization for Computer Operation at Branch Offices**

##### **(1) Internal organization**

###### **1) Systems Planning**

This function is understood as one of the most important functions for the computer department. However, only a few banks have personnel who are responsible for this function. In order to adjust their in-house system to payment system, this section will have a more important role in constructing useful data processing systems. The responsibilities of this organization are:

- Reviewing business process
- Collecting users' requirements
- Analysis of users' operation
- Formulation of a master plan for redesigning the system
- Presentation of a master plan
- Definition of development projects
- Administration of development projects

## 2) Development and implementation

Most banks have their own personnel for programming. Programmers seem well trained to solve user's individual problems. They have high level of knowledge for database software, utility programs, and bundled software such as spread sheets and word processing programs on the MS-DOS platform.

According our survey, it is found that the designing phase is missing in the procedure of systems development here. Their usual method of systems development is:

- Users survey to determine their requirements
- Programming, immediately after survey
- Testing by the programmer
- Validation by the users
- Installation

This is partly due to the size of data processing system. Most development tasks are small enough for a single programmer to finish. Another reason is possibly due to the lack of information for systems development. Books, papers, or magazines for systems engineering or programming are rarely found at bookstores and offices in Bishkek.

For the development of large systems such as payment system covering the whole country, designing phase is mandatory to breakdown the system into several components, in order to ensure easy programming and to control projects. Among these phases are:

- Definition of requirement : for functions and conditions
- Project planning : for organization and scheduling
- Quality planning : level of quality
- Selecting Methodology : for development methods and tools
- Selecting Products : platform and middle ware
- Detail specifications : breakdown of the functions, design of database, etc.
- Technical instructions : instructions on actual production

The implementation of the payment system is a good opportunity to establish a standard for the development processes.

### 3) Technical services

This is also one of the major organizations of the financial institutions in the country, concerning to the data processing system. Technical services are hardly obtained locally in this country. Most banks have their own personnel for the technical assistance and services. Although they are experiencing trouble in obtaining detailed technical information, most staffs are accepting a high level of responsibility.

### 4) Operations

All the operations are being done either internally by the local users, or externally by the CC of NBK. Payment system will require each commercial bank to order take additional operations for the in-house switching of transaction messages of both inter and intra-bank payment and for keeping intra-bank accounts. The idea of the host system needs to be introduced to improve the operation of the headquarters.

### 5) End users

End users are performing a major part of systems operation. This is due to the current system 'Operation Day' running on the standalone PCs. All the offices, both head and branch offices, are operating their local system with their own local data. When data transmission services are established, close

connections between local offices and headquarters are expected. This will enable end users to operate their local system with the common and latest information, together with the latest version of software.

(2) Organizations outside the banks

1) Data processing services

As mentioned in the previous section, data processing services are provided by the CC of NBK.

2) System services, development and integration

There are five system services companies in Bishkek, and at least one company is delivering their services to the banking market. This company, with a staff of 60 staffs, used to be the major computer center in this area, and is keeping in touch with four banks, providing not only software development but also hardware supply and maintenance services. Most of their services are provided on DOS PCs with Intel chips. Service on the UNIX platform is now under preparation.

3) Staff training

Regarding staff training, it is notable that the Automation Department of NBK themselves provide training to the students of the state university or polytechnic colleges. This kind of training is also being done by the system services company. Staff training is important for both NBK and the commercial banks to operate and to maintain payment system in stable status.

**5-4-3-2 Computer Operation as the Users of Payment System**

(1) Operations at branch offices

The functions of 'Operation Day of Bank' covers deposits, loans, money transfer, and general accounting. Since this system is designed to run on the stand-alone PCs, it may not fit the big banks or branch offices with large volume of transactions.

One of the large banks has started to renew its application system to meet its condition of operation. Their trial is based on the 'client/server architecture' on LAN basis that enables a flexible configuration. With this architecture, the user can start their operation with single small PCs, and expand the system up to 200 client systems with some servers on a single connection. The flexible configuration for the banking software results in highly effective investment.

## **(2) Operations at the headquarters**

At NBK and three large banks, typical operations at the headquarters are:

- Providing one of the PCs as the switching system
- Data collection, mainly accounting data, on a switching system
- Consolidation of balances of general accounting
- Printing and delivery

Main operations at the headquarters are data collection and delivery. When communication services enable banks to build a centralized database over the whole bank, requirements for complicated operations may create a need for:

- On-line intra-bank settlement
- On-line deposits operation
- Credit card settlement service
- Automated debiting service for utility charges, rent, etc.
- Salary payment to the clients' employees
- CD/ATM on-line services

### **5-4-3-3 Issues and Problems**

Improvement of users' environment is necessary before introducing payment system. The following are suggested:

## **(1) Planning organization**

Planning personnel is strongly recommended. They are expected to understand the strategies and the concepts of payment systems based on computer networks.

This will help the commercial banks to adjust their in-house systems to payment system.

**(2) Implementation personnel**

For the implementation and the operation of payment system, the following organization will be necessary:

- Organization for the implementation of a central system that performs final settlement
- Organization for the implementation of the computer network
- (Internal) organization for the implementation of the user interface at offices. Later, this organization will be requested to be responsible for the instruction of the staffs of the branch offices.
- Organization for the systems operations at every site of both the central system and the network systems.

**(3) Separation of operation staffs and development staffs**

There is one more recommendation on the organization of operations. It is found that, in a few cases, the development staffs are involved in the live operation. For example, FOREX data collected by the switching system of the Automation Department of NBK are handled by one of the development staffs. When FOREX records are delivered to the FOREX Department from the switching machine for 'information center' service ( refer to 5-5-2-3 (2) ), one of the development staffs at the Automation Department sorts these records for the delivery.

When the requirement for security increases, this kind of operation should be performed by staff members who are not involved in any part of the development. This is to prevent improper access and unexpected alteration of the live data.

**5-4-4 Telecommunications**

**5-4-4-1 Overview**

The Ministry of Communication (MOC) is a single government organization responsible for both nationwide postal and telecommunications services in the country.

In the function of management in postal services, MOC supervises mail and parcel delivery systems and manages post offices, of which there are more than 700 in the entire country. In managing telecommunication services, MOC covers facility management and operation in both telephone network systems and broadcasting services, including TV and radio broadcasting.

MOC is a single organization in the government which is responsible for both services, although the Ministry is considering separation of supervision of their services due to the many difficulties of simultaneous operation and revenue unbalances between the two. Revenue unbalance is a very critical issue. For example, in the 4th quarter of 1993, total revenue of the Ministry from the two services was 20.7 million Som. Among this, 4.4 million Som came from the postal services and 16.3 million Som (telephone services: 15.0 million Som, broadcasting services: 1.3 million Som) from the telecommunication services operation.

Although MOC functions and acts as both a national telecommunication carrier and a government agency which is responsible for management of the postal and telecommunication services, there is no clear concept of MOC as a "national telecommunication carrier," or "national common carrier" at present. Among many other countries, organizations which exist as national common carriers are completely separated from the ministries or other government agencies which are responsible for supervision of the carriers. Even if the ministry and national common carrier are in the same organization, deregulation and separation of the two by establishing different organizations or creating privately stock-held companies is the present world tendency. For example, Nippon Telegraph and Telephone (NTT), the largest national common carrier in Japan, used to be under the management of the Ministry of Posts and Telecommunication of the Japanese government, but became a private stock holding corporation in early 1980s, even the Ministry of Finance in the Japanese government still holds larger portion of its stocks. Another example is in the United States. By implementation of the "Carter Phone Act," American Telegraph and Telephone (AT & T), the largest telecommunication carrier in the world, was divided into 8 regional stock holding companies (Bell Operating Companies: BOC) and many small locally operated companies called "baby bells."

Kyrgyz is now following the world tendency of the deregulation in the area of telecommunication services by privatizing the telecommunication services section. And

for this, the documentation for the privatization is on the ways of internal process at this moment.

In the function of telephone network management services, one of the major responsibilities of the Ministry is to issue licenses to the public upon the request for telephone installation from the applicants, to structure and authorize telephone billing systems, and to protect the benefit and rights of the telephone users and the Ministry.

#### **5-4-4-2 Organization Structure of the Ministry of Communication**

There are approximately 13,000 employees under management of MOC. 50% of them are working in the postal service section, and the rest (approx. 6,500) are in the telecommunication services section. Among those who are in the telecommunication services section, 10% of the total is considered as management and administrative personnel, 20% as engineers, and between 55 and 60% is considered as field engineers who are responsible for maintenance and support of the telecommunication facilities and equipment such as transmission lines and poles, house phones, exchange systems and multiplexers, microwave stations, and so on.

#### **5-4-4-3 Structure of Telecommunication Systems**

##### **(1) Nation-Wide Network Systems**

As shown in the Figure 5-12, the nationwide telecommunication network systems in Kyrgyz is based on a hierarchical type of structure of the network switching systems, but not a mesh type of structure. It is a highly centralized telecommunication networking structure which is integrated in one center. All of the telephone transmissions coming from one end of the country of small towns to the other edge of the country have to go through the center stations installed in Bishkek.

It should be noted that the conditions of the network systems in this country are very critical particularly when building up computer and communication network systems. The most serious issue in this systems configuration of the hierarchical switching network structure is that there are no re-routing ways for the circuit if both equipment and lines are broken down. On the other hand, a mesh type of telecommunication network configuration has a greater advantage compare to



single hub and sub-hub type configuration network structures to prevent the hazards facing the total network systems.

(2) Intra-City Network Links

Intra-city stations in Bishkek have 21 switching stations which start their prefix numbers from 21- to 29-, and from 40- to 44-. There is a 48- station which is presently under construction. As shown in Table 5-12, there are station identification numbers of each stations starting from 21- to 44-9-. Model of exchange systems are also shown in the table with their type of exchange method. For example, if either a small or large character "K" is indicated in the model of the exchange system, it refers to a cross-bar type of exchange system. Models without the character "K" refer to step-by-step types which is the most primitive type of exchange system. Most exchange systems currently in use within the country, not only in Kyrgyz also in other former Soviet Union, were produced by former East Germany, former Soviet Union nations, and Czechoslovakia.

These equipment were installed between the second half of the 1970s and 80s with some exceptions. Some equipment models were installed in 1956 even if it was the same model as other exchange systems which were installed much later than the ones installed in the 50s. This fact indicates that either Kyrgyz has not been supplied with newer systems or that when it was supplied from the original producing countries, it did not have any chances to have the equipment installed for a long time period.

The line capacity is also shown in the table. The number of feeding lines indicate the capacity of the switching equipment. The larger numbers of the feeding lines show the larger capacity of the equipment. The actual numbers of lines used are also indicated in the figure, and refer to how many telephone lines are connected to each switching systems equipment. Rate of usage of the line indicates the percentages of actual numbers of line for use of the telephone lines compare to the maximum number of line capacity of each switching systems.

It is quite surprising that rate of use for each switching equipment in percentage number are very high, ranging from the lowest ,44 %, to the highest 100 %. The average among all stations in Bishkek reaches to 90 %. That indicates, for

example in station 23-, there are no vacancies for installation of new telephone lines for expansion. This is quite a serious issue, particularly for banks that need to install and enhance their computer systems networks, and to improve their routine operation of daily banks activities.

Table 5-13 shows the list of telephone stations in Issyk-kul region by indicating capacity of the switching systems with the maximum capacity and actual number of telephone in use and rate of use of the circuit. As shown in the table, use rates of the exchange systems compared with the actual capacity of the switching system are very high, like the ones installed in Bishkek.

### (3) Inter-City Network Links

Figure 5-12 and Figure 5-13 show inter-city network systems by pointing at Bishkek as a center station (Network hub) and its network extension to the satellite cities of each state and region within the country. In the Figures, number of telephone circuit capacity and actual number of circuit in use are indicated. Based on the numbers indicated in the figures, the rate of use of each trunk circuit lines by dividing these two numbers can be shown in the table below:

Hub Center	To	Capacity	Actual	*Rate of Use
Bishkek	Talas	600 lines	300 lines	50 %
Bishkek	Jalal-abad	300 lines	120 lines	30 %
Bishkek	Osh	600 lines	300 lines	50 %
Bishkek	Balykchi	600 lines	300 lines	50 %
Bishkek	Cholpan ata	300 lines	300 lines	100 %
Total		2,400 lines	1,320 lines	55 %

(Source: Ministry of Communication)

(Note: \* Rate of Usage=Actual line/ Capacity line)

The exchange systems being used in Bishkek for interconnections of telephone lines mentioned above has its capacity of 600 lines per a interconnection of two major cities. Most exchange systems currently being used for telephone network system have a capacity of 1,000 lines per stations. There are 16 major exchange stations covering the entire country which make up to 140,000 lines total (One

station is out of order now). Inter-city transmission systems have to go through the inter-city gateway station currently installed in Bishkek.

One of the major existing problems with to the interface of the telephone network system is that there is no backup system in any of the country telecommunication network systems available even in Bishkek when transmissions go through the Capital city of the Republic. In this circumstances, it is highly required for the country to rehabilitate not only existing systems but also establishing backup network systems.

Table 5-14 shows a list of telephone stations of the major cities in Kyrgyz. As shown in the table, most exchange systems equipment were installed during the period between 1963, and 1989. Most of the exchange systems are cross-bar type with their maximum telephone line feeding capacity ranges from 500 lines to 8,000 lines. Number of lines in actual use also ranges from 400 to 6,000 circuit lines. A higher rate of line use is especially critical in Kaindin station because it is showing 100 % use of the capacity. The average percentage of the rate of line use indicates 82 %, a very high rate compared to other countries, which have rates ranging between 50 % to 60 % average.

#### (4) Inter-CIS Network Links

Telephone network systems between Kyrgyz and other CIS countries (out-bound, or out-going network) are fairly well developed, however, the number of available telephone circuits are not yet at a satisfactory level compared to the inter-CIS network gateway systems of other CIS countries (in-bound, or in-coming network).

The number of telephone circuits between Kyrgyz and major cities of other CIS countries are shown in the Figure 5-14. The following shows the capacity of the exchanging system from Bishkek gateway stations to each destination station, and the actual number of circuits in use.

	Capacity	Actual	Rate of Use *
To Alma Ata	600 lines	168 lines	28 %
To Moscow	600 lines	120 lines	20 %
To Cambul	600 lines	60 lines	10 %
Total	1,320 lines	228 lines	19 %

(Source: Ministry of Communication)

(Note: \* Rate of Use=Actual line/Capacity line)

#### (5) International Network Gateways

Inter-city transmission equipment functions not only for domestic lines but activates as the gateways to international telephone network systems. Under inter-city transmission gateway station, three major switching systems are equipped; a switching system to connect Alma Ata and Tashkent (which has its number of telephone lines 2,500), a system which has a direct line to Moscow (with 1,000) lines, and the last, which has 2,500 direct lines to Turkey through microwave transmission systems and IntelSat satellite transmission systems.

The system, which has a direct access line to the international gateway, has been equipped by funds from Turkish government and equipment from the French telecommunication manufacturer Alcatel. However, the Ministry of Communication is not quite satisfied because the systems equipment have limited functions in network management systems and billing systems for issuing records of telephone calls. Also the system has no function for interconnection to local city-network interface. Figure 5-14 is also shown international telephone network gateway systems.

#### 5-4-4-4 Means of Transmission

Since 96% of the country is mountainous in Kyrgyz, microwave transmission system is one of the major means of telecommunication transmission. Approximately 85 % of the telephone circuits have been transmitted by the microwave transmission links. There are 66 microwave stations at present, and most of the stations are located on the top of mountains at altitudes ranging from 2,600 meters to 4,200 meters. Table 5-15 shows a part of existing microwave stations between Bishkek and Karakol. There is a distance of approximately 300 Km between the two cities.

As the means of transmission of the telephone lines, most covered in the country is analog lines (99%) used in both major cities and regions, and other 1% is digital lines used only for inter-city connections. There is no concept of so-called "leased lines" or "private lines" in Kyrgyz. Therefore, most telephone lines are referred to as public telephone network lines. There is a line closely referred to as leased line among total telephone network systems. This line (Iskla-I) has been used as both government and the military private telecommunication lines when Kyrgyz existed as one of the satellite countries of the former USSR. However, the country began to allow the public to use the line as a transmission line for telecommunication media, particularly for voice transmission.

#### **5-4-4-5 Facility and Equipment of Telecommunication Systems**

Most facility and equipment used for telecommunication network systems in the country are relatively old compare to the ones being used in other foreign countries. Both step-by-step and cross-bar type of exchange equipment are dominant among most of the existing systems. The lines being used for transmission, including underground and aerial lines, are either parallel feeder or coaxial cables used only for small portion, or mixed usage of these two lines. Twisted pairs telephone cables have been used for only in-house cabling.

However, connections between multiplexer by coaxial cables and parallel feeders are partly being used, but only in very small portion, for long distance transmission lines.

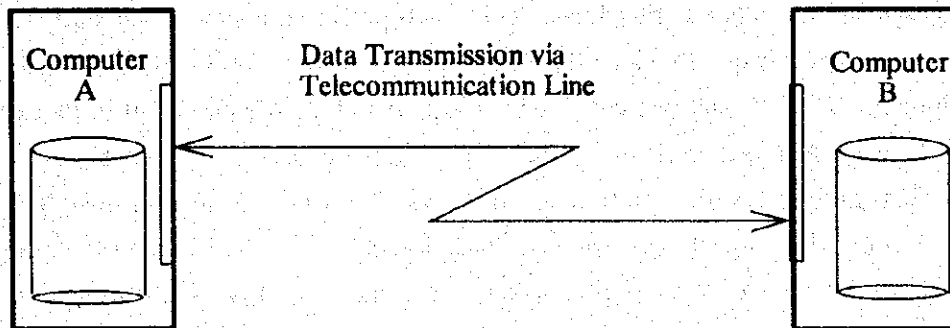
#### **5-4-4-6 Quality of Telecommunication Lines**

Quality of telecommunication lines in Kyrgyz, generally speaking, is not good due to the old facilities and equipment installed. Most equipment currently installed was manufactured by the former Soviet Union and other East European countries, including former East Germany, Hungary, Czechoslovakia, etc., and the first these were installed in the late 50s. Also, maintenance of and support of this equipment was not well furnished, particularly after the independence of the country from the former Soviet Union.

There are two stations, however, which have relatively better quality of telephone lines compared to other station lines. These two prefix numbers, which start from 21- and 28-, are of fair quality since the exchange system was installed later than the other equipment. The 21- stations which have cross-bars type of equipment in its exchange system, were installed in 1986. The 28- stations, also cross-bar exchange systems, were installed in 1980. Both exchange systems were made and installed by a manufacturer of former East Germany. The coverage area of 21- and 28- stations are very limited within Bishkek and concentrated in the central portion, from the railroad stations toward south portion of the city. Under the 21- station exchange system, the present number of 9,000 telephone lines are connected, and there are 1,000 lines still available for installation upon the request from the applicants. But, the area coverage for new installation is very limited. The Ministry of Communication was planning to install new stations in addition to above two prefix number stations mentioned, however, the station 29- had not been installed due to high installation and operations costs. The entire systems and equipment of this 29- station facility have been stored in the storage room of MOC.

Quality of telecommunication circuits can be measured from two aspects when reviewing the current status of telecommunication in this country. One is the quality of voice when telecommunication facility has been used as telephone (voice transmission), and the other is the quality when data from a computer has been transmitted to other computers (data transmission). It is quite identical when voice is transmitted via telephone line recognizing by two parties who are involved in transmissions of voice by telephone conversation (telephone users). Telephone users can easily find out its quality of the telephone physically, for example by noise, echoes, circuit down, etc.

In data transmission, measurement of line quality can be done by only those computers involved in the data transmission. The basic concepts of the data transmissions are shown in the figure below:



- Data transaction will be carried out between two computers
- If the data from one computer were sent safely to another computer, it is considered that data transmission has been successful
- If the data from one computer were not sent safely to another computer, it is considered that data transmission has failed
- Success or failure of data transmission between two computers can be identified in each computer by software installed in these computers and data transaction identification systems installed in the hardware
- When error messages appear on computer monitors, it is considered as data transmission failure between the computers
- Error rate is a percentage of transaction failure via number of time accessed from each computer

Transaction error occurs for various reasons; hardware and software failure, non-accurate and mis-operation by computer operators, transmission line failure, and damages of the telecommunication equipment, particularly transmission exchange systems.

The following table shows replies from commercial banks when the Study Team visited and asked the average error rates during the data transmission using their personal computers via telephone circuits.

	9:00–12:00	1:00–4:00	Peak Time
Bank A	10	10	15
Bank B	15	10	10
Bank C	20	15	20
Bank D	30	30	30
Bank E	10	15	15
Bank F	15	10	15
Average	17	15	17

(Source: Study Team)

It was quite obvious that causes of the high number of error rates occurring among above banks in Kyrgyz come from mainly the use of primitive types of exchange systems and heavy use of telecommunication lines.

#### **5-4-4-7 Special Telecommunication Circuits**

##### **(1) Business Lines**

From January 1st in 1994, new telephone transmission called Business Lines became available for the commercial enterprise users. In terms of its quality of the line, Business Lines have better quality compare to the ones that already exist in the country. With parallel to its quality of the line, both installation cost and fees for line use (telephone bills) are also higher than existing telephone circuits.

The initial installation cost of the Business Lines is equivalent to US \$ 60.0, which is considered as very high cost for installation in the country. Monthly fee for line use is also higher than existing telephone circuit lines. The initial monthly charge (basic fee) is US \$ 5.00 equivalent, and it increases depending on customers use of the circuit. According to the Ministry of Communication, Business Lines are available in most major cities in the country to meet with the requirement from the customers, provided that they are able to pay the required fees for installation and monthly running cost.

##### **(2) Iskla-I**

Iskla-I was installed by the former East Germany. The major objectives of the installation was to use for internal communication network systems within the



government and in the military in case of emergencies. Iskla-I is presently connected to the main inter-city exchange system (only digital exchange equipment installed in the country at present), and its gateway system was installed in Bishkek. It is an completely independent transmission systems from other both inter-city and intra-city telephone network systems. Available number of lines for installation at present time to the exchange system is 1,000.

Figure 5-15 shows the overall network system configuration of Iskla-I. Although, Iskla-I is classified as governmental and the military leased lines, there are public telephone trunk lines between each of the nodes, which are located mostly in the major cities throughout the country and these, public telephone trunk lines for Iskla-I have been used as the means of transmission.

There used to be plans for installation of a branch line of Iskla-I in Osh and major cities in other regions and states of the country, however, the construction of the systems in those cities were partly postponed due to high cost of installation and operations, support and maintenance of the total system. But, node systems (connecting points for exchange and switching) for Iskla-I still exist in those cities.

#### **5-4-4-8 Networking Plans**

The concept of "computer and communication" is extremely important when planning and implementing computer systems, particularly multiple-site computer systems to be connected with telecommunication network systems. Therefore, it is required to ascertain the current status of the existing telecommunication network systems and future development plans to apply for installation of the computer network systems in the Study project.

In this section, telecommunication networking plan which are under consideration by both Kyrgyz side and by other international organizations and their available funds are analyzed to refer for implementation of the computer systems in the Study.

##### **(1) Government of Kyrgyz Republic**

The Ministry of Communication has plans to either install new telephone systems or rehabilitate existing systems. However, due to the critical situation of

affordable budget management, most future plans are not feasible at this moment. The only feasible project in terms of facilitating new systems or rehabilitation of the existing system is to implement the project along with the ones which are planned by available funds from the international organizations.

The projects which are affordable with the support of international organizations are very limited, however, due to the aforementioned budget problems and more complicated existing problems such as lack of state of art technologies, equipment manufacturing process, absence of highly trained engineers, and so on.

Some tasks that the Ministry can supply in the project which will be furnished by the international organizations include construction of microwave station towers and supplying electricity power generators to those existing microwave stations, etc., along with the project mentioned hereunder.

## (2) Funds from International Organizations

### 1) World Bank and EBRD Project

The World Bank is one of the leading international organizations involved in the Official Development Assistance (ODA) program in the Krygyz Republic. Currently, the World Bank and EBRD are considering the first telecommunication project in the country. According to the World Bank's First Telecommunications Project Final Executive Summary, the main objectives of this program are to assist the Kyrgyz government to prioritize replacement and expansion of investments in telecommunications support the country's economic growth and improve the quality of service; to build institutional capacity of the main telecommunications operator, particularly management and financial analysis skills, and commercialize and corporatize communication activities; and to establish a regulatory and policy framework for the restructuring of the sector, aimed at liberalizing and attracting private sector investment to the sector.

Figure 5-16 shows part of the World Bank and EBRD's development plans on furnishing telecommunication network trunk lines between Bishkek and other major cities in the regions including Talas, Jalal-abad, Osh, Chalponata, Karakol and Naryn. The project is mainly consists of

replacement/expansion, institutional development, technical assistance and training, and sector restructuring.

At this moment, there what of the Study Team on the World Bank and EBRD are intending to do the project is only in the conceptual phase, however, the following contents of the project can be expected for the implementation of the computer networking plan for the bank payment systems which will be undertaken by the JICA Study Team.

- a. The project of the World Bank and EBRD covers development of the telecommunication systems between Bishkek and major cities in each region
- b. Existing microwave stations will be used as major means for circuit transmission, at least for transmission of the trunk lines from the node to node stations
- c. Osh should be considered as the location for the circuit terminal stations, and no further node stations can be considered for expansion of the circuit
- d. Also, Bishkek is to be considered as a location for terminal stations, but can be extended to the west bound regions of Karakol, south-west bound regions of Naryn, and east bound region of Talas
- e. Exchange systems (switching equipment) will be installed in the node point, Bishkek, Talas, Chalponata, Karakol, Jalal-abad, Osh and Naryn
- f. Only trunk lines are to be developed and expanded, but not branch lines, which go into the end users sites including individual homes and corporations

Overall network configurations of telecommunication systems in the World Bank and EBRD project include followings;

- a. Total number of telephone lines is 40,000.
- b. Regarding number of telephone lines between Bishkek (central station) and other major cities within the country are:
  - Talas 1,000 lines
  - Chalponata 20,000 lines

- Jalal-abad            7,500 lines
- Naryn                1,000 lines
- c. Regarding number of telephone lines between major cities in each region (inter-city connection) are:
  - Chalponata and Karakol    5,000 lines
  - Jalal-abad and Osh        5,500 lines
- d. Speed of 2 Mbps band-width trunk circuit which is getting common use in worldwide is going to be used to cover entire telecommunication networks
- e. Although Bishkek is considered as network hub and terminal station for domestic telephone networks, also it has direct connection capability to international telephone network gateways by using French made (ALCATEL) S-12 switching systems which has access to Intelsat satellite communication systems

Total budget for entire project that the World Bank and EBRD are planning is \$30 million. Among them \$21 million is to be supplied from the World Bank, \$9 mill from EBRD.

## **5-5 Current Conditions and Problems on the Payment System**

### **5-5-1 Processing Accounts at NBK and Commercial Banks, and Relationship to the Payment System**

#### **(1) Framework for Account Processing for Payments**

In the Republic of Kyrgyz, processing of accounts in connection with payments is as noted below, on the basis of the regulations for payments between banks (No. 051-1/70, April 21, 1993).

- Intra-bank payments are not made by correspondent accounts but handled within the bank.
- Payments when funds are transferred to another bank are by means of correspondent accounts, not through NBK account.
- Transfer of funds from one correspondent account to another is done through the intermediary of a bank that has a transfer and correspondent deposit in an account at the NBK (i.e., a clearing bank).
- The most important account numbers for payment business are followings.
  - No. 161 Commercial Bank's correspondent accounts.
  - No. 162 Direct correspondent accounts opened by Commercial Banks' branch offices for CIS countries.
  - No. 164 Saving and Crediting banks 'branch offices' correspondent accounts
  - No. 165 KyrgyzVneshEkonomicBank commercial banks' correspondent accounts
  - No. 166 PromstroyBank commercial banks' correspondent account
  - No. 167 AgropromBank commercial banks' correspondent account
  - No. 168 Kyrgyzstan commercial banks' correspondent account
  - No. 835 Payment transactions among the NBK branch offices
  - No. 836 Interstate payment transactions
  - No. 871 Payment transactions among bank's branch offices served by the same Computer Center
  - No. 890 Payment transactions among the same banks' branch offices
  - No. 903 Sums on payment transactions within the Republic not confirmed yet

## **(2) The Inter-relationship Between Accounts and the Payment System**

The inter-relation between accounts and the payment system as follows:

- Assuming that the amount to be paid is fixed, the longer the delay in payment, the greater the balance of unsettled or outstanding obligations. Conversely, faster payment reduces the unsettled balance.
- It is possible to use the outstanding balance of a given province or a given bank, or the ratio of it to the volume of funds transferred, as a measure of the reliability and efficiency of the regions and banks about the payment system.
- If the balances in correspondent accounts are analyzed in the same way as outstanding balances, it will be possible to measure the efficiency of the payment system. The more efficient the system, the less reserves will be required.
- Thus, if such a desirable inter-bank payment system exists, outstanding balances and correspondent account balances will be fewer in number and reduced in scale, that can be said to be a mark of the reliability and efficiency of the inter-bank payment system.
- However, it is difficult to estimate from the level of a customer's account balance how quickly payments are being made. Even though it can be said that a payment system can be evaluated on the basis of the level of account balances, there is a limit to what can be done.
- Regarding the scale of payment amounts, in the case of domestic payments because the method of debiting correspondent accounts is used, the result is similar to a cumulative amount on the debit side of the correspondent account.

Below are examples of how accounts are processed in keeping with payment flows.

## **(3) Account Processing for Intra-bank Payments**

Example: Agroprombank (APB) sends funds from S branch to R branch.

1) Summary of account processing

APB	Sender's a/c		A/C	903	A/C	890
S branch	x		x	x		x

APB	A/C	890	payee's a/c	
R branch	x			x

2) Procedure of account processing

- Branch S makes the following entry, in triplicate, and sends two of the three copies of the payment notification to Branch R.

Note: For payments within Chui, it is possible to ask the Computer Center to take care of the procedures.

Debit	Credit
(Dr) Sender's a/c	(Cr) A/C 903 Unconfirmed payments

- Having received the notification, branch R makes the following entry.

(Dr) A/C 890 Inter-branch account	(Cr) Payee's a/c
--------------------------------------	------------------

One copy is stamped by the branch and sent to branch S.

- Having received confirmation from branch R, branch S makes the following entry.

(Dr) A/C 903 Unconfirmed payments	(Cr) A/C 890 Inter-branch account
--------------------------------------	--------------------------------------

(4) Processing of accounts for payments between the three major banks

1) Remission to outside Chui

The following is an example, that of a payment from branch S of Agroprombank (APB) to branch R of Promstroybank (PSB) without the support of the Computer Center.

(A) Summary of account processing

APB	Sender's a/c	A/C 903	A/C 890
S branch	x	x	x
		x	
APB	A/C 890	A/C 909	A/C 166
RHO	x	x	x
		x	
PSB	A/C 167	A/C 903	A/C 890
RHO	x	x	x
		x	
PSB	A/C 890	payee's a/c	
R branch	x	x	

(B) Procedure of account processing

First, at S branch of APB, the following entry is made. Of the three copies of the payment notification, two are sent to the Regional Head



Office (RHO, where a correspondent account has been opened) of APB.

Debit	Credit
(Dr) Sender's a/c	(Cr) A/C 903 Unconfirmed payments against RHO

Second, the APB's RHO that has received the two copies makes the following entry and sends one copy to S branch of APB. And then makes another three copies of the payment notification, and the two are sent to PSB.

(Dr) A/C 890 Inter-branch account	(Cr) A/C 909 Unconfirmed payments against PSB
--------------------------------------	---

Third, S branch of APB makes the following entry after receiving the confirmation notice from the RHO of APB.

(Dr) A/C 903 Unconfirmed payments	(Cr) A/C 890 Inter-branch account
--------------------------------------	--------------------------------------

Fourth, the RHO of PSB, having received the notification from APB, makes the following entry. Then sends a confirmation to APB and the notification to the R branch.

(Dr) A/C 167 Deduct from APB's correspondent account	(Cr) A/C 903 Unconfirmed payments against branch R
--	--

Note: In the above, when the recipient is a customer of the RHO of PSB, the credit is to the payee's account.

Fifth, the RHO of APB, having received the confirmation from PSB, makes the following entry.

(Dr) A/C 909 Unconfirmed payments against PSB	(Cr) Payee's a/c Deduct from correspondent account with PSB
---	--

Sixth, the R branch of PSB that has received the notification from PSB's RHO makes the following entry, and then sends a confirmation to the RHO of PSB.

(Dr) A/C 890 Inter-branch account	(Cr) Payee's a/c
--------------------------------------	------------------

Seventh, once the confirmation from branch R is received the RHO of PSB makes this entry.

(Dr) A/C 903 Unconfirmed payments	(Cr) A/C 890 Inter-branch account
--------------------------------------	--------------------------------------

## 2) Remission within Chui

Remission within Chui differs from remission to outside it as follows.

First, in place of A/C 909, A/C 871 (Payment transactions among bank's branch offices served by the same Computer Center) is used. Second, the remitting branch requests by Telex to the Computer Center that funds be

sent. Third, information payment system balances is provided as a service by the Computer Center.

(5) Processing of accounts for settlements related to Rashotonaya Parata

1) Contribution funds to the Rashotonaya Parata

EXAMPLE 1:

Participating banks P1 and P2 has each contribution fund 600 Som and 400 Som respectively to the Rashotonaya Parata. The funds are credited by the Rashotonaya Parata to the correspondent accounts with APB in the name of Rashotonaya Parata.

(a) Account processing at bank P1

Debit	Credit
(Dr) Deposit to Rashotonaya Parata 600	(Cr) Cash 600

(b) Account processing at bank P2

(Dr) Deposit to Rashotonaya Parata 400	(Cr) Cash 400
--	---------------

(c) Account processing at Rashotonaya Parata

(Dr) A/C 167 1000 Correspondent accounts with APB	(Cr) Rec'd 1000 Deposit from account of participating bank
--	---

(d) Correspondent account balances

P1's share: 600

P2's share: 400

Correspondent account balance:  $600+400 = 1000$

The RP calculates the daily share of each participating bank in the correspondent account and notifies it to the banks, so as far as the banks are payment system it is just as if they had individual correspondent accounts.

## 2) Payments between participating banks

### EXAMPLE 2:

First, 100 Som have been transferred from bank P1 to bank P2.

Second, there is a separate transfer of 800 Som from bank P2 to bank P1.

Third, on that day there are no payments other than these.

#### (a) Account processing at P1

Debit		Credit	
(Dr) Sender's a/c	100	(Cr) A/C	871 100
(Dr) A/C	871 80	(Cr) Payee's a/c	80

#### (b) Account processing at P2

(Dr) Sender's a/c	80	(Cr) A/C	871 80
A/C	871 100	Payee's a/c	100

#### (c) Account processing at the RP

(Dr) Rec'd	20	(Cr) Deposit	20
Add to P1's share		Deduct from P2's share	

The balance of the correspondent account has not changed and there is no need to modify the record. But the shares of the participating banks in the correspondent account change.

(d) Calculation of the balance of the correspondent account

P1's share:  $600 - 100 + 80 = 580$

P2's share:  $400 + 100 - 80 = 420$

Correspondent account balance:  $580 + 420 = 1000$

The Rashotonaya Parata calculates each participating bank's share daily, and notify to each member bank.

3) Account processing for payments to any of the three major banks

EXAMPLE 3:

First, 70 Som have been sent from bank P1 to APB. Second, 100 Som have been sent from APB to bank P1. Third, on that day there are no payments other than these.

(a) Account processing at P1

Debit			Credit		
(Dr)	Sender's a/c	70	(Cr)	A/C	871
	A/C	871		Payee's a/c	100
		100			

(b) Account processing at APB

(Dr)	A/C	161	70	(Cr)	Payee's a/c	70
	(Rashotonaya Parata's correspondent account)				A/C	871
						100
	Sender's a/c		100			

(c) Account processing at Rashotonaya Parata

(Dr) A/C      871      70	(Cr) A/C      167      70 (Correspondent account with APB)
(Dr) A/C      167      100 (Correspondent account with APB)	(Cr) A/C      871      100

(d) Calculation of the balance of the correspondent account

P1's share:  $580 - 70 + 100 = 610$

P2's share:  $420 + 0 - 0 = 420$

Correspondent account balance:  $610 + 420 = 1030 (+30 \text{ D/D})$

The Rashotonaya Parata calculates each participating bank's share daily, and notify them.

(6) Account processing aspects of inter-bank transfers

By debiting from other banks, bank's disposable capital finance and by selling their own capital the leading banks (Headquarters offices or regional headquarters) can identify their correspondent accounts.

Example 1:

Agroprombank (APB) wishes to make a deposit in its correspondent account with Promstroybank (PSB) by means of the disposable capital (account with NBK) in its own bank.

(A) Summary of account processing

APB	A/C	822	A/C	167
	x			x
		x	x	
NBK	A/C	167	A/C	166
	x			x
PSB	A/C	166	A/C	167
	x			x

(B) Procedures of account processing

First, APB makes the following entry and submits a request for payment to NBK.

Debit	Credit
(Dr) A/C 822 Unconfirmed payments	(Cr) A/C 167 Deduct from own account with NBK

Second, NBK, having received the request, makes the following transfer.

(Dr) A/C 167 Deduct from APB account with NBK	(Cr) A/C 166 Add to PSB account with NBK
---	--

Third, PSB makes the following entry on the basis of instructions from NBK.

(Dr) A/C 166 Add to own account with NBK	(Cr) A/C 167 Add to APB's correspondent account with PSB
--	---

Fourth, on receipt of confirmation from PSB, APB makes the following entry.

(Dr) A/C 167 Add to own correspondent account	(Cr) A/C 822 Unconfirmed payments
---	--------------------------------------

By means of the above procedures, APB has been able to transfer funds from the account with NBK to its own correspondent account with PSB.

#### Example 2:

Agroprombank (APB) wishes to transfer funds from its own correspondent account with Akniet Bank to its own correspondent account with Maksat Bank.

#### (A) Summary of account processing

APB	A/C 161	A/C 909
x	x	x
Akniet	A/C 167	A/C 161
x	x	x



Maksat	A/C	161	A/C	167
	x			x

(B) Procedures of account processing

First, APB makes the following entry and asks Akniet to transfer funds from its own funds from Akniet to Maksat.

Debit	Credit
(Dr) A/C 161 Add to correspondent account with Maksat	(Cr) A/C 909 Unconfirmed payments against Maksat

Second, Akniet, having received the request, makes the following entry.

(Dr) A/C 167 Deduct from APB's correspondent account	(Cr) A/C 161 Add to Maksat's correspondent account
--	--

Third, Maksat, having received the request from Akniet, makes the following entry.

(Dr) A/C 161 Add to correspondent account with Akniet	(Cr) A/C 167 Add to APB's correspondent account with Maksat
---	---

Fourth, APB, having received confirmation from Maksat, makes the following entry.

(Dr) A/C 909

Unconfirmed payments

(Cr) A/C 161

Deduct from correspondent  
account with Akniet

By means of the above procedures, APB has been able to transfer its own funds from Akniet to Maksat.

## **5-5-2 Relation between State of Development of the Financial Market and the Payment System**

### **(1) Relation of the Financial Market and the Payment System**

#### **1) The Financial Market and the Inter-bank Market**

Financial markets are broadly separated into long-term and short-term markets depending on the maturity of the instruments or duration of transactions, into a short-term or money market and capital market.

Participation in the inter-bank market, that is one part of a short-term market, is limited to financial institutions and is a place where banks can adjust their short-term positions by lending and borrowing funds.

In the inter-bank market the ultimate settlements are made between banks and since the market has the nature of functioning to adjust overages or shortages of funds among financial institutions, the payments system has a close relationship to the functioning of the market.

**Note:** The inter-bank market in Japan includes a call market where funds are borrowed and lent among financial institutions on the basis of a loan contract, and a bill discount market where fund transfers are made by the discounting of bills. Most transactions are done through money brokers.]

## 2) Relation Between the Inter-bank Market and Payments System

The various transactions made by companies and individuals such as making and receiving cash payments through banks, or making transfers from one bank account to another, are all done through the inter-bank clearing mechanism. The inter-bank market thus provides a venue for adjusting the small levels of funds between financial institutions as required by those transactions. Therefore the inter-bank market may be said to be the place where ultimately all financial transactions of a nation are payment systemtrated, and in a sense is indispensable to the payment system to which it provides the adjustment of fund levels between financial institutions.

The development of an inter-bank market, however, requires its own supporting infrastructure to be improved. In particular, without a speedy, accurate mechanism for payment of large sums of money to be made in the market, the market cannot exist.

Thus, the inter-bank market and the payments system are mutually complementary. Each helps the other to grow and develop.

## (2) Present Conditions and Problems of the Kyrgyz Financial Market

The financial system in Kyrgyz relies primarily on indirect finance, and development of the financial and capital market can not be said to be adequate. In the country at this time other than the short-term financial market, nor a market for stocks and bonds.

NBK, wishes to proceed with reform of the financial market as quickly as possible, has taken note of the first signs of formation of a free financial market that will help support the national economy, but the following problems exist among the prevailing conditions.

- Financial institutions obtain the funds they need primarily by borrowing from the NBK and deposits made by business corporations, and the environment is not conducive for free money transactions through an inter-bank market.

- There is no benchmark to indicate the level, or help in the setting, of interest rates. Bank deposit and lending rates are made with reference to the NBK credit auction rate.
- The NBK is not using the financial adjustment methods normally associated with the activity of a central bank in the nation's financial market. The NBK is engaged in a review of its practices and has the intention of introducing a new system (see note below) with the objective of improving the capability for adjustments in the levels of money in the market but at the present time the only method used is intermittent control of the volume of funds according to decisions by the NBK.

Note: The NBK has primarily used the reserve requirement and a refinance facility as instruments for monetary control. The bank is now engaged in a review of the system incorporated reform of the reserve requirements, and trying to enforce function of controlling volumes of capital market. introduction of a credit auction facility and a lombard credit facility, as well as competitive auctioning of Treasury Bills.

### (3) Necessity for Creation of an Inter-bank Market and Improvement of the Payment System

In order to facilitate economic activities it is necessary to create a financial market that can properly allocate capital -- the life-blood of industry -- to industries and companies. It is desirable to create an inter-bank market at the earliest possible time, for the following reasons.

- It will enable the banks to continually adjust their own positions, while capital will be effectively allocated by credit supply and control of credit scale, through the working of the pricing mechanism.
- By the borrowing and lending of funds among the banks, a free market where short-term interest rates are determined will be created.

In the Kyrgyz Republic at the present time, where the system is based on correspondent agreements between banks, it would be an extremely difficult task to create a smoothly functioning payment system, such as this example: When A branch of Agroprom Bank is to make a payment to B branch of Promstroy if there

is an overall shortage at Agroprombank, Agroprombank obtains the funds it needs from other banks in an inter-bank market.

In the event that Agroprombank has funds at a different branch or at another bank, without a smoothly functioning payment system that enables money to be moved quickly, it would not be possible for there to be efficient supply of funds.

Even though an effective inter-bank market may be created, it is still necessary to provide infrastructure to support it. In that sense, whether or not an inter-bank market is created and operates satisfactorily will determine how well the payment system will function.

### **5-5-3 Conditions Regarding Delay of Payment, Survey to Determine the Background of Delay, and Relationship between Business Activities and Payment Delays**

#### **(1) Conditions Regarding Delay of Payment**

No accurate information on the duration and extent of delays in receipt of payments in Kyrgyz is known to exist, and study of this is limited to subjective and limited information.

Efforts were made at the time of the field study to determine the duration of delays but without success, so reliance has had to be placed on the results of questionnaire surveys carried out when the study team visited banks and business firms.

Question: How many days are needed to make payment (a) within your own region, (b) to other regions, and (c) to other CIS countries and non-CIS countries?

Although results were not adequate, responses were received from 11 commercial banks and 18 companies. Results from the former are tabulated in Figure 5-17, "Payment Fulfillment Analysis: Answers from Commercial Banks." In this figure, the number of days is indicated on the horizontal axis, separately for each of the three parts of the question's answers, with suitable graphic depiction of those answers that were expressed in terms of a range (for example, "2 to 7 days" within

the region, on the first line of "A"). Ovals were drawn to represent generalized responses. Results can be summarized as follows.

#### Replies from Commercial Banks

Within the region: 1-3 days  
To other regions: 4-7 days  
To CIS countries: 1-10 days

Responses from business companies visits are given in Figure 5-18 "Payment Fulfillment Analysis: Answers from Corporations." It was not possible to obtain a meaningful number of answers regarding payment to CIS countries but is worth mentioning that it was found that 2-3 months were required for CIS countries and 7-14 days for other West European countries and the United States.

#### Replies from Business Firms

Within the region: 2-3 days  
To other regions: 7-10 days

Some differences are evident among the two groups. Although the difference in the case of payment within the region is not great, among the business firms, there were also two groups that said 5-7 and 10-15 days were needed. This suggests that the payments are not always accomplished as smoothly as responses from banks indicate them to be.

Regarding the number of days for payments to other regions as well there was a similarity in that the commercial banks' answers were 4-7 days and the companies answers were mostly 7-10 days, but there were many companies that replied that 15 days or longer were needed. There were even some that said 2-3 months, indicating that some problems exist.

Regarding the number of days for payments to be made to CIS countries, in view of the fact that payments are not now being made through central banks, it may not be suitable to state that it is necessary to wait for the results. Nevertheless, in comparison to the replies that payments to other countries, including West

European countries and the United States, takes 7–14 days, it is desirable that improvements be made so that the process can be faster.

(2) Survey to Determine the Background of Delay

In order to judge whether there is a delay in the payment process, a clear basis for measurement is needed. It is necessary to approach this through both the desires on the part of the payer and technical limitations imposed on the process.

Looking at the situation first from the viewpoint of the payer, it is desirable that the bank requested to make the payment do so as promptly as possible. For example, it is desirable that the payment be made at once, or on the same day, or at latest the day following, the day of the payment request. This is conventional in the industrialized countries.

In Kyrgyz, however, with the exception of payments withing Chui and Osh, because paper documents are used and only in exceptional cases is a courier used instead of the mail, a long duration of time is required for the collection, dispatch and transmission of documents. It may be noted, however, that if regular, scheduled service was available to each region, the pick-up and transportation of documents probably could be done within a day.

Question: What is the probable number of days required to make a payment to another region?

Transmission from the branch to the region's collection center:	1 day
From the collection center to the destination region's collection center	2 days (via Chui)
From the second collection center to the destination branch:	1 day
Processing within the destination branch:	1 day
Total:	5 days

Processing of a payment within the same region, or to an adjacent region, can be shortened relative to the above, if a route that does not pass through Chui can be used.

Question: What is the probable number of days required to make a payment within the same region?

Transmission from the branch to the collection center:	0.5 to 1 day
Transmission to the destination branch, and processing there:	0.5 to 1 day
Total:	1 day to 2 days

Further, depending on the number of scheduled services between regions, it would be possible to reduce the total number of days required. In any event, as long as paper documents are used, it is estimated that 2 days will be required for payment within the same region and 5 days for payment to another region. These two durations, 2 and 5 days, are imposed by the technical restraints that now exist, and elimination or easing of those restraints would mean it will be possible to shorten the time needed.

As seen in just before, the number of days actually required exceeds these two, 2 days and 5 days. It may be thought that the difference (additional time) is attributable other reasons of the payments system (see Figure 5-19).

In the same way as there is no accurate understanding of the number of days that are required to have payments made, despite the common complaint that payments are late, investigation of the technical reasons for this will no yield clear results. This is because the problem has deep roots and the investigation may not lead to the real causes. Below, several causes that were identified through the study are examined.

#### A. Banks' shortage of funds for payment

On several occasions it was heard that a bank that had received a request to make payment on behalf of a client, even though the bank intended to do so,



it lacked the funds on hand and hence needed time to obtain the funds for remission. This signifies that many commercial banks have an overdraft on the reserved funds at the central bank. If there is an overdraft at those accounts it is highly likely that there are insufficient funds in the correspondent accounts as well.

It is desirable that there be fundamental measures taken in the area of financial policy so that this problem can be eliminated.

**B. Lack of dedication to providing customer service**

There are some who are disturbed that there is a lack of a thorough dedication to providing service to customers, on the part of banks that are asked to remit funds on behalf of their customers.

From the viewpoint of the customers of bank services, it is difficult to accept failure of a bank to carry out a request that funds owned by the customer be paid to a certain designated party. The customer's funds on deposit at the bank are the property of the customer who naturally has every right to withdraw funds as seen fit. Provisionally, consider the possibility that a customer visits a bank, makes a deposit, and then on the spot asks that the funds that have just been deposited to send to a certain party, but is told that the bank lacks sufficient funds to make the payment. Would the customer then have to withdraw funds, and ask the bank to transfer the cash?

It must be stated that if a bank is at any given time short of its own funds and can not make a payment that ostensibly is done using funds owned by a customer, it is a fundamental problem with regard to that bank. The bank must execute the customer's request completely, accurately and promptly. If this is not the case, the bank is deficient in dedication to providing customer service.

**(3) Relationship Between Business Activities and Payment Delays**

When company visits were made, comments were solicited on the delays in the payment process. Many managers had the strong impression that not much was to

be expected from a bank's payment service. This was evident in the following comments.

[Comments by managers]

"In many cases when money is to be transferred, it is done without using banks. When we want to transform money really in a hurry, we take cash personally to make payment. Banks are used only when large sums must be sent relatively far away. At such times there is a big problem because of lack of knowledge of when the money will be received at the other end."

It is most saddening that businesses, and individuals can not rely on banks for one of the most fundamental banking services, the transfer of funds in payment of a debt.

Delays in the making of payments through the banks have adverse effects on the performance of companies, by reducing the turnover of capital. For example, if payment in a specific case requires 10 days, meaning that the money cannot be used for that period, taking the annual rate of interest on loans of 260%,

$$260\% \times (10)/(365) = 7.1\%$$

To have payment made on the same day it is requested saves the equivalent of 7% in interest.

(4) **Relation to Presidential Directive, Ordinance of the Government of the Kyrgyz Republic and Board of Directors' of NBK**

As of February, 1994, Ordinance of the Government of the Kyrgyz Republic and Board of Directors' of NBK was released, in connection with the duration of the period for payment. There are two relevant points to this ordinance as follows:

1. **Maximum periods within which payments must be made, when funds are being paid within Kyrgyz**

Within the same city: 3 days

Within the same region: 5 days

Within the republic: 7 days

2. Penalties for failure to abide by these limits

This upper limit, when compared to the number of days required as noted above, is seen to have a 3-day grace period so that it should be possible to reduce the number of days actually required as these additional days are not due to technical reasons.

The impressions of the study team, however, regarding this ordinance are that this may not be a practical possibility, as many comments were heard to the effect that "Actually...it can't be done." According to this ordinance, if it is possible to shorten the period needed for payment, we should be able to expect that further shortening of the period can be achieved by making technical improvements. During the second field survey in summer of 1994, the Study Team members had discussions with those who are involved in this matter, however, the comments which brought up from most of them were that nothing had been changed so far.

#### **5-5-4 Present Problems of the Payment System**

The existing problems of the payment system in Kyrgyz, taken as (1) overall problems of the system, and (2) problems of participating entities, are as follows.

(1) General Problems of the Payment System

Besides there being a serious depression of the real economy in Kyrgyz, there is a problem in the financial sector in that the payment system is not efficient and is not stable.

As conditions that existed prior to emergence of this problem the following are taken up as background economic and social factors, or problems, in analyzing the payment system. Under the socialist economy system, there was a belittling of commerce and finance, and an absence of a sense of self-responsibility for managing any enterprise; against this background, few people deposited money in banks, and there was a strong preference to settle accounts by paying in cash.

The following three observations can be made regarding the present problems of the payments system, from the viewpoints of efficiency, stability, and international capability.

- Delays, or prolongation, of periods before payment is made.
- The complicated nature of the payments system, and absence of finality of NBK.
- Underdeveloped payment systems for crossborder and intra-CIS payments.

1) Delays and Prolonged Periods to Payment

The problem of long periods until payment is received creates a serious problem for economic transactions in Kyrgyz.

The long duration until payments are received means that outstanding balances due are increased, slowing down the circulation of money in the economy and increasing settlement risk.

It is believed that the creation of an efficient payment system in the course of transition to a market economy will not only facilitate an increase in production by freeing up funds that had been caught up and slowed down by the payment processes, but also contribute to reduction of inflation by establishing a foundation for economic activities through promoting a sense of self-responsibility among entrepreneurs.

(A) Conditions of Delay in the Payment

The duration required until payment is received, as the study team determined through discussions at companies and analysis of questionnaire responses, is as follows.

a) Within the same region (province)

When the recipient is within the same region (province) as the remitter of payments, payment is received normally in between 2 to 3 days it is sent, but in some cases more than one week are required.

b) **Between regions**

The payment period ranges from 7 days to as long as 10 days but when funds are to be sent to provincial cities such as Bishkek or Naryn, in some cases more than a month is required.

c) **To/from other CIS nations, and non-CIS nations**

In the case of CIS nations from two months to three months is required, and when it is a non-CIS country that is involved, from one weeks to two weeks are needed.

**(B) Background of Delays**

Evidently the background factors causing delays are the large volume of paperwork that must be done owing to lagging of systematization, a long period of time that is needed for business procedures, and existence of an inadequately--developed telecommunications network.

Further, apart from problems related to computer systems, it is believed that the decline of the real economy during the phase of transition to a market economy, by worsening conditions for procurement of funds, as well as inadequacies in the services sector that have their roots in the socialist economy of the past, is a cause of delay.

a) **Lagging systematization**

**Systematization of banking business procedures**

The level of systematization at any given commercial bank is not very high, and in general much of the work is performed manually by use of paper documents and forms. Further, systematization has not progressed beyond the level of systematization for discrete business procedures and there are no comprehensive systems in place.

The greatest problem from the standpoint of delays in or prolongation of the payment period, nevertheless, is the method of processing work. In general there are no on-line real-time systems; batch processing is used and this imposes a limit to what can be done to speed up work. As the reason for not adopting on-line real-time systems, while there are some technical problems, the inadequate state of development of the telecommunications system is considered to be the greatest bottleneck.

Systematization of transmission of payment-related information between banks and branches:

The transmission of payment-related information between banks (or branches) ultimately depends on paperwork and the mails. The underdeveloped telecommunications network is the reason for this.

b) Underdeveloped state of the telecommunications network

The greatest bottleneck to improvement of the payments system in Kyrgyz is the underdeveloped telecommunications network, the inadequate quality of telecommunications and the low reliability of the system. Part of the nation's telecommunications system is was installed as recently as the 1980s but most of it dates to the 1960s, and has the following problems.

- Antiquated telephone lines within Bishkek city (insufficient number of lines; line interference, poor connections)
- Inadequate facilities for inter-city telecommunications (insufficient number of lines, all lines go via Bishkek, no backup routing )

Thus, it is of great importance by looking at year 2000 in connection with planning improvement of the payment system to obtain an understanding of what is being planned for improvement of the telecommunication system, through such measures as installation of high-quality lines (Iskla-I), or a World Bank microwave project (digitalization).

c) **Deterioration of fund procurement by banks**

According to the results of discussions and the questionnaire, it is judged that as a result of deterioration of the real economy and deterioration of the banks' positions (overdrafts) resulting from it, that there are some cases of deliberate efforts being made to counter the problem of a shortage of funds by delaying the transfer of money.

If such a practice becomes entrenched, the low level of confidence in banks will be further reduced through the slowing of the movement of money and increase in payment risk, giving rise to a vicious cycle of economic stagnation.

In order to promote smooth economic activities, it is necessary to reduce the huge amount of idle money, and provide for a suitable allocation of what is "the blood of industry" in accordance with the realities of requirements.

Further, the fabrication of a payments system will serve to prevent improper acts by banks and companies (whether such acts are intended or accidental), and will be of value in improving the transparency of the business of inter mediation in the payment process.

d) **Lack of Awareness Regarding Swift Payment Remission Service**

It may be thought that the problem of lack of awareness regarding a swift payment remission service, that became established during the era of socialist economics, comprises a man-made factor in the background for delays in completion of the payment process. The Kyrgyz Republic, having passed many years as a socialist state, has a tendency, with regard to the people as a whole, to be inadequately oriented toward providing satisfying service to customers, and it can not be denied that this is hampering efforts to make a neat transition to a market economy.

It is desirable that there be a revolution in attitudes held by bank employees but also by the people of the nation in general. It would be effective to undertake education and training of bank employees such as is done in major Western countries and Japan.

In February 1994 a directive was issued that calls for the speeding up of remission of funds and it will be of considerable interest to see how this directive is effective in changing awareness in the banks and improving payment services.

2) Complexity of the Payment System, and Absence of Finality of Payment in NBK

(a) Complexity of the payment system

Prior to May 1993 both inter-bank and intra-bank payments were made through RKC. In that month, revision of regulations governing payments between banks resulted in separating NBK from the payment process, so that the payment system was radically changed. Moreover, in June of that year smaller commercial banks (other than the three major ones) created the Rashotonaya Parata, making the payment system more complicated than it was.

For example, the flow and procedures differ according to the combination of destination, type of paying party and region (Chui, Osh, or another), and according to whether a Computer Center is involved, the Rashotonaya Parata is involved, a "regional coordinating branch" is involved, a bank head office is involved, and everything could vary also according to the specific bank making the payment. There were some ways that payment to another region became more inconvenient than when the RKC was used, for example, inter-bank payment in the regions other than Chui Region has to go through RP or CC, and some people at the commercial banks and NBK are in favor of a return to the RKC.



(b) Absence of finality of payments in NBK

The Kyrgyz Republic's payment system at present has a major problem that is NBK does not guarantee the finality of a given payment. The IMF has recommended that inter-bank payments be made by use of correspondent accounts at the NBK, and although the bank has committed itself to making such arrangements by October 1993, this far they have not been realized. It is extremely important for the central bank, from the overall point of view and such concepts are being accepted by the major development countries, to enforce the means of settlement with finality to avoid from the various payment risks. Payment risks and the necessity for NBK's settlement with finality are briefly described hereunder.

a) Payment System and Related Risks

Recently, accelerated globalization, the increased use of electronics, and the growing amount of transaction have made the issue related to reduction of risk latent in the payment system the most important payment system among major industrialized countries.

An inter-bank payment transaction may not be settled for various reasons, such as deterioration of financial condition of the paying party, and computer breakdown. Such risks related to the payment system are roughly classified into credit risk and liquidity risk. In addition, such risk may surface in the payment system and spread to the entire system in the form of chain reaction. This is called systemic risk.

(1) Credit risk

When a party in a payment transaction becomes default due to deterioration of financial condition and other reasons, other party suffers damage. The possibility that such situation occurs is called credit risk. Damage due to default in a payment transaction may develop to the total loss of the principal amount or may be limited to only part thereof. When considering credit risk, the former is called

principal risk. On the other hand, the latter is called price fluctuating risk or replacement cost risk, for the non-defaulting party may suffer damage when it attempts to procure (or replace) funds or securities that become unavailable due to the default, which may become more costly thereafter.

(2) Liquidity risk

This is a risk of difficult in payment to a third party due to the lack of liquidity as a result of a temporary delay in payment caused by surfaced credit risk or computer breakdown.

(3) Systemic risk

Once credit risk or liquidity risk occurs, it may extend to other participants in the payment system through credit relations created in the payment process, namely the presence of unsettled balances.

To build the payment system that has the ability to avoid the above risks, private financial institutions (commercial banks) and the central bank (NBK) are expected to realize the need for an efficient and safe mechanism between them.

b) Possible Measures to Reduce Systemic Risk

Given today's increasingly globalizing inter-bank transactions that have been dramatically growing in amount and are increasingly linked through electronics, systemic risk, once surfaced, may spread quickly to a wide range of transaction systems. To minimize such risk, risk reduction measures covering the entire system as well as individual financial institutions need to be considered. Possible measures to reduce systemic risk are as follow:

(1) Streaming of payment transaction

Systemic risk can be reduced by streamlining payment transactions, thus to minimize the duration of credit relations or unsettled balances

among banks. Technically, this involves reduction of time lag until final settlement in the entire payment transaction process. In the transaction process, even if a client has sent a payment instruction to its receiver, the transaction remains unsettled until final transaction between two banks involved is completed. By reducing time required up to the final transaction between banks, therefore, the presence of unsettled balance is reduced in duration to reduce systemic risk.

(2) Concurrent transactions

In securities trading and currency exchange, if one party delivers funds (or securities) to other party in advance, then the other party becomes unable to deliver securities (or funds) in return, the non-default party faces a risk of losing the principal amount of the transaction in question. This can be avoided by delivering funds and securities or currencies at the same time (concurrent transaction), thus to reduce systemic risk significantly.

(3) Quantitative reduction of unsettled balance

The amount of unsettled balance can be controlled by efforts of participants in the payment system to limit credit against others or own net credit.

Also when two parties make different transactions on the same article, due date, etc., they can settle the transaction by calculating the net credit and obligation for each transaction, which is then replaced with a new set of credit and obligation. This is called obligation netting and is an effective method of reducing the unsettled balance, thus systemic risk.

In addition, reduction of systemic risk can be achieved by developing and reinforcing the effective use of collateral and rules for loss sharing.

c) **Necessity for the finality of payment in NBK**

In examining the risks related to payment settlement and the unsettled balance issues, it is important to check as to which stage the settlement process is completed. In this sense, the means of settlement capable of making final settlement is called the settlement method with finality (the ability to complete payment). Primary examples are bank notes as liabilities of the central bank and current deposits at the central bank.

When the means of settlement with finality is used, credit supply which has occurred between parties in transaction is canceled when the settlement is made, and so are related unsettled balance and payment risks. Thus, it is very important to reduce the payment risk by devising measures to improve the level of finality in the payment system.

As mentioned earlier, systemic risk cannot be dealt with by efforts of individual financial institutions. Rather, risk reduction measures on a macro scale to envisage the entire financial system are required.

Worldwide, such measures are planned and implemented by central banks. In doing so, the central bank must make efforts to streamline and stabilize the means of settlement with finality which it provides. Also, when risk surfaces, the central bank is expected to provide adequate liquidity as the final lender.

(c) **Background of the Issues**

Whilst these problems are consequences of the many and varied measures taken since independence to effect a transit from to a market economy while being in a period of economic and social turmoil, but it also is because the function of realizing a payment has been entrusted to a commercial banks, and fabrication of a payments system has proceeded at the initiative of commercial banks, without attainment of a close fit or coordination of individual systems.

In Japan too, systematization at a private bank is basically a matter for the bank to decide. But they are provided with access to accounts at the Bank of Japan whereby the central bank assures the finality of a payment, as well as the national banking federation's system, and the computerized BOJ Net (network) system. It goes without saying that close fit or coordination of the overall system, and assurance that there are interfaces between systems.

It may also be said to be an exceedingly important matter for the Kyrgyz Republic, in the event that a strong effort is made towards establishing a payment system with the target year of 2000, that there be created the basic system that has as its basis the guarantee of finality by means of use of accounts at the NBK and incorporating the payment system of a clearinghouse, as well as being a system that is made of up integrated subsystems.

3) Underdevelopment of the Payments Mechanism for Crossborder and CIS Nation Payments

(a) Present conditions of payments

The crossborder (inter-bank) payment system has two forms in the republic. One is a correspondent system between banks such as is standard in the industrialized countries. The other is a payment system, which is characteristics to CIS nations, using transfers between central banks.

Because of the time required for payments to be made between central banks, the NBK advises commercial banks to make payments through commercial banks.

It has been planned that as of April of this year that basically payments through commercial banks would be made by using mutual correspondent accounts. As one consequence, the NBK would be involved only when there are special payments, such as inter-governmental payment, or when very large sums are being transferred between governments.

(b) Background for delay in nation payments

In the republic, because of confusion created within the payment system by the great structural changes taking place in the transition to a market economy, there has not been much experience accumulated in the actual use of the system as it now exists, and trade between the Kyrgyz Republic and CIS nations has stagnated.

As background for the great delay in crossborder payments, first of all, the payment system using central bank correspondent accounts is extremely inefficient. For example, when a commercial bank of Kyrgyz send payment direction to one of the commercial banks in Russia, the bank of Kyrgyz has to go through first NBK, then Central Bank of Russia and finally to the commercial bank in Russia. Also computerization in this whole process of payment is further behind. And second there is a shortage of credit facilities support needed to cover the shortage in the country's hard currency (even when there are mutual corespondent accounts, overdrafts are not permitted of the other bank).

There is a movement at present among the CIS nations to establish a new system of payment amongst them, and the NBK is preparing for some changes. (Refer to (3) Establishment of an Intergovernmental Bank in 5-3-6 Crossborder Payments System)

(2) Problems of the participants in the payment system

1) NBK

NBK, properly, should be provided with far-ranging powers of supervision and oversight of financial institutions, as an administrative agency of the government. However, NBK has to continue for its contribution to the development of both financial and payment systems in the country, NBK may be said to have the following problems.

- There is no section which has functions similar to Financial and Payment System Department of Bank of Japan that having the task of making plans and proposals for improving the domestic payment system in a comprehensive and specialized manner, and can not, as a central bank, undertake the planning, proposing and operational aspects of properly improving the payment system. To an extent such a role is given to the Automation Division, but there activities tend to emphasize technical affairs.
- Even as the central bank, NBK is not involved in making the finality services such as credit-finality issuing function to avoid from system risks in the payment systems.

## 2) Computer Center

The Computer Centers have the following problems.

- Because the computer equipment is antiquated, it is not capable of handling the increased volumes expected in the future.
- Because the software used is obsolete, the centers cannot provide the services desired by their customers (e.g., addition of more account items, or more detailed service).

When looking at the future, there seems to be a problem in relation to determining the role and function of computer centers in the nation's payment system.

## 3) Rashotonaya Parata

The Rashotonaya Parata, that is an independent body, provides benefits through simplification of the transmission of information, reducing the amount of money needed for payments and improving the efficiency of payments between participating institutions, but also has the following problems.

- Because of the capital base is insufficient, its organizational basis is weak and if there is a shortage of funds at one of the participating

institutions, it is possible that the Rashotonaya Parata could experience a functional breakdown.

- The finality of a transaction such as where the NBK is an intermediary is missing. To the extent that a participating institution does not experience a shortage of funds, the Rashotonaya Parata can function efficiently, but one failure resulting in a shortage of funds, unless this can be covered by another institution, has the danger of easily leading to destruction of the Rashotonaya Parata.
- The three major banks are not participating, and there are limitations as to who can participate. Further, the only region receiving support is Chui.

The Rashotonaya Parata is an effective system for overcoming liquidity limitations of small commercial banks, but it is necessary to consider the possibility of an expanded role and function, and changes, in the context of reformation of the nation's payment system.

#### 4) Commercial Banks

There are some banks that are relatively advanced with regard to their own systematization, but in general the commercial banks have the following problems.

- Remission of funds (except in Chui and Osh) requires paperwork (in some cases telex is used) and this is wasteful.
- The banks' computer systematizations is in the initial stage.
- Retention and education of personnel is not adequate.

There are some banks that are eager to establish and improve their systems, but it is essential that when they do so they remain fully aware of what is done in the future to fabricate a national payment system, and of the direction being taken with regard to that system, and that they seek to coordinate their own systems with the payment system.



## **5-6 Review of Development Strategy and Planning for Bank Payment Systems**

### **5-6-1 Payment System for Improvement of the Clearinghouse**

#### **(1) Background for Start of the Clearinghouse Project**

- [1] A new scheme for the payment system, introduced by NBK in May 1993, has the objective of improving the liquidity management of commercial banks and encouraging private sector's initiatives.
- [2] By means of the start of this scheme, the NBK's RKC was abolished and as payments between banks came to be made by use of correspondent accounts, NBK was no longer directly involved in payment processing.
- [3] As one result, the Rashotonaya Parata was established by smaller banks as a means of improving the efficiency of the payments system.
- [4] After it was established there was considerable confusion but after that order was established. But because there was no fundamental improvement of the means of communication used, combined with lack of a service-orientation by which efforts are normally made to speed up the payment process as well as a deterioration of the financial position of the banks, the problem of the long period required for payment has not been eliminated.
- [5] Because of this, starting in autumn of 1993, the Parliament took up the improvement of the payment system as an issue of payment system, and at a meeting of the directors of NBK in December a decision was made to improve the system. On the basis of this decision, a Clearinghouse project has been begun and is being promoted, principally by the Automation Division of the NBK.

#### **(2) Outline of the Payment system**

##### **1) Services to be offered by the Clearinghouse**

- [1] Exchange of payment instructions between participating banks.
- [2] Calculation of net positions of participating banks
- [3] Final settlement through accounts of participating banks at the NBK.

##### **(3) Structure of the clearinghouse**

- [1] Participants: All commercial banks.

- [2] Principal organization: Five Regional Clearing Centers (RCCs), one "Cleaning House" in Bishkek (CH).
- [3] Cleaning institution: RCCs and Cleaning House
- [4] Final method of payment (settlement): Deposit to account at the NBK.

### 3) Procedures for Clearing & Settlement

- [1] Payment instructions (PI) are delivered to the appropriate Regional Clearing Center (RCC) by 5 p.m. each business day. A list is submitted by the paying bank at that time to the RCC giving the number of payments and amounts to be paid, by region.
- [2] On the morning of the following business day, the receiving bank receives the PI, and if it is in error it is returned by noon.
- [3] By 1 p.m. each business day the RCC calculates the region's banks' net positions based on the previous business day's PI received.
- [4] By 1:30 p.m. that day the RCC in each region sends a Telex message to the clearinghouse (CH) in Bishkek giving the net position of the banks of each region respectively.
- [5] By 2 p.m. that day the CH tabulates the position of each bank by region by bank, and calculates the position of each bank.
- [6] By 2:30 that day, the CH informs each bank of its position and of the bank's balance in its NBK account, and by 3 p.m. confirms the clearing positions.
- [7] By 4 p.m. that day, any bank that is in a short position borrows the required amount through an inter-bank loan or selling assets.
- [8] By 5 p.m. that day, NBK makes the final settlement at the NBK.
- [9] The CH informs each bank that settlement has been made.

### 4) Measures when a bank is short

#### [1] Sharing loan rule

In the event that a bank can not cover a shortfall by borrowing from or selling assets to another bank, those banks having funds in their accounts at the NBK provide inter-bank loans in proportion to the amounts of their balances, to cover the shortfall.

#### [2] NBK lombard lending

In the event that neither borrowing, selling assets nor sharing loans are sufficient to cover a shortfall, the bank that is short may request the central bank for an overnight loan (lombard loan). The central bank then decides whether or not to lend money.

[3] Freezing results of the clearing session

If even a lombard loan is not sufficient, on the basis of an agreement made by the central bank and the clearinghouse, it is possible to freeze the results of the clearing session until the following business day.

(3) Issues related to Realization of the Clearinghouse Payment system

The following are the major issues related to realizing the Clearinghouse payment system.

[1] That the NBK as the central bank is providing finality to the payment system is to be highly evaluated.

[2] For the banks to agree to participate and for the system to function, however, it is necessary that (a) the overall framework for financial transactions be improved, such as by improvement of the appropriate regulations regarding maintenance of confidentiality of information obtained through oversight and administration, and by clarification of laws regarding rights to collateral, as well as (b) the following points.

1) Measures to prevent delays in remission of funds

[1] Speeding up payments between banks, reduction of balances in banks' correspondent accounts, rationalization of collection and delivery of documents will be brought by Realization of the Cleaning house. However, the problem of long times needed for payments to other regions can not be improved by mail transfer.

[2] It would be desirable to introduce a service that would speed up payments by means of Telex between RCCs, until computer-computer linkages are operational.

2) Supply of credit by the central bank

[1] In general, in order to avert the danger of occurrence of system risk in a payment network system, central banks function as "lenders of last resort" whereby they

provide credit to participants, in order to back up the system. If a bank is short of funds but can get credit from the central bank, then damage will not spread to other banks.

- [2] In connection with the retarded state of development of the inter-bank market in Kyrgyz at this time it would be desirable to formulate operational rules to be followed when the central bank must act as lender of the last resort.

- 3) Harmonization of the interests of different parties using the existing system

There are some functions of the Clearinghouse and Rashotonaya Parata that are duplicated by or made redundant by the clearinghouse. Unless the smaller commercial banks that have formed the Rashotonaya Parata can be shown the advantages they would obtain from the clearinghouse, they will lack incentive to participate.

- 4) Spelling out the procedures for paperwork

If effort is given to spelling out the procedures for paperwork, it will reveal the problems that have to be eliminated from the system. It is necessary to provide a clear and full statement to the commercial banks as to what procedures are to be used, and how banks must keep their accounts and records.

- 5) Estimation of the cost of establishing and operating the Clearinghouse

It is necessary to estimate the cost of establishing and operating the clearinghouse, and indicate to the commercial banks what their shares of the costs will be, and obtain their consent.

#### **5-6-2 Activity Related to the Payment System**

- (1) Modernization of NBK's Accounting

- [1] In December 1994, NBK will convert to use of a new accounting system, acting on the advice of the IMF. It begins to use the same accounting items as generally used in the Western nations.

- [2] Commercial banks, nevertheless, still arrive at their balances by use of the system adopted during the Soviet Union period. There is a plan for support by the World

Bank for a change in the accounting and internal audit methods at commercial banks, and change of the accounting system is certain to be realized.

- [3] In accordance with the above, it is necessary to proceed with review and revision of the payments system on the basis of the assumption that the internal systems of the commercial banks will be changed.

(2) Improvement of the computer at the NBK Computer Center

- [1] The old computer now in use at the central bank's Computer Center must be replaced with a new one and in the near future this is expected to be realized as part of the Clearinghouse project, on the basis of support plan for which the EBRD is preparing a feasibility study.
- [2] The organization and mode of operation of the payment system will be greatly influenced by how the computer at the NBK Computer Center is used.

## **5-7 Analysis of Restraints in Developing a Payment System, and Advantages**

### **5-7-1 Limitations of the Telecommunications Network**

In Kyrgyz the limitations imposed by the existing telecommunications network must be the first thing to be discussed any time improvement of the payment system by use of a computer network system is to be considered.

Details of the telecommunications network and its future outlook are presented in chapter 5-4-4, and here only main relevant points are summarized.

(1) Adverse Conditions in Telecommunications

In general, conditions in telecommunications are limited. There are not a sufficient number of lines whether inter-urban or intra-urban, connections are not reliably made and sound quality is poor owing to a high level of noise. These are significant problems in connection with use of computers, for telecommunications involved in computer networks must have stable service and quality.

**(2) Providing Access to Iskla As A Matter of National Interest**

Despite the conditions as described above, good telecommunications lines do exist, but they are for the use of the government. In the interest of improving the payment system, it would be valuable if, since individual banks are difficult to use the Iskla system, for a quasi-governmental body to be given access to the lines. This may be justifiable if the improvement of the payment system is recognized to be of fundamental and great importance for the national economy. In order that such a view be widely accepted, it is thought to be most important that the bank payment system improvement efforts be carried out primarily under the sponsorship of the central bank, and with participation by a large number of commercial banks.

**(3) Step-by-Step Progress**

A variety of agencies have undertaken studies on improvement of telecommunications in Kyrgyz, and it is hoped that concrete plans will be prepared and implemented as soon as possible.

The program for improvement of the bank payment system, however, should not be held up until telecommunications is improved. It is thought to be important to proceed steadily, on a step-by-step basis.

It may be stated that it is indispensable to maintain flexibility, so while always having an image of the final system, those resources that are available at any given time are each used in turn as the system is gradually improved.

To do that, it is desirable to fully define the theoretical aspects of the system's components, and to develop the payments system so that it may be modified in keeping with technical improvements in the telecommunications area.

**5-7-2 Lack of Experience in Using Large Systems**

Computer usage in Kyrgyz at present is almost exclusively confined to stand-alone use of personal computers and use of local area networks (LAN) is still in the starting stage.

It is easy to anticipate that when the bank payment system using computers begins to function, the increase in traffic volume in the system will require that medium to large transaction processing power be installed at computer centers as well as key points in each province.

The actual computer hardware will satisfy following basic criteria.

**(A) Flexibility and Enhanceability**

The system may become a large one in future, but at the beginning it will start in a moderate size. The function of the system will be added, and ability of the system will be enhanced.

In the same manner, economical and financial mechanism might change and be enhanced. The computer network system will follow these changes and enhancement.

**(B) Ease of implementation and maintenance**

There might be some ways to develop the software system, the final installation and maintenance after the installation will be done in Kyrgyz. That means ease of development software is also very important.

Ease of implementation means ease of acquire, ease of developping software, ease of maintaining the hardware, ease of maintaining software etc.

**(C) Open and Standard**

The system will connect with many other systems in future. Some candidates are:

- Banking systems of many commercial banks
- Central banks of some CIS countries, such as Russia, Kazakhstan and
- Some corporations which want to connect their computers with banking network systems

The basic system is required to accept these computers to be connected, so, open and standard architecture will be desired.

(1) Inexperience

The NBK has been using an old-type general-purpose computer at its computer center. During the period from the middle to the end of the 1980s it is said that an IBM360 machine was used; this was not current technology at the time.

In Kyrgyz there is no experience that has been accumulated in working with recent general-purpose machines, nor has there been acquisition of the new technology current today for use with medium- to large-transactions processing power.

Further, there has been little experience in managing large-scale system development projects that require organizing and managing a large number of persons. From the viewpoint that the development and installation are to be accomplished successfully within the pre-defined budget and schedule, it is necessary that support be obtained from an outside party.

(2) The Merit of Not Being Restricted by Older Technology

Recently computers have been improved over earlier models by being made easier to use. A wide variety of user tools are now available. It is not imaginable that the same difficulties that have been experienced when NBK originally acquired its general purpose computers for the computer center will be repeated.

This also may be taken, conversely, to mean that the NBK is being restrained in no small way by the old system's assets now in use. Fundamentally improving the system in the future, will eliminate such limitations. There will be little limitation in future decisions created by the existence of many assets in the form of programs made using the old technology, that must be considered for possible use in new systems. In general a start from 'zero' will be made but it is a fortunate matter that the start is not being made from a 'negative' situation. What is foremost is that the situation is favorable in that the best technology will be used.



### **5-7-3 Personnel and Stance for Development**

If the decision to proceed with planning for improvement of the bank payment system, it shall be the persons affiliated with Kyrgyz's banks that shall bring the plan to realization. It may be possible to obtain assistance from other nations, but they will provide assistance and not play the central role of implementation. It must be Kyrgyz people who are at the core of the planning and implementation of plans. More precisely, it will be persons at the NBK, persons at the commercial banks, and persons working in relation to information services.

- (1) **Technological Levels Being High, Desire to Absorb Knowledge Must Be Great; But It Is Made Possible by Appropriate Leadership and Support**

The study team has been working with a number of persons who probably will be involved in planning the improvement of the bank payment system. Many discussions have been held with them. As one result the study team understands that the level of education as well as technological standards of those people are high, they are eager to absorb additional knowledge, and possess great potential. As is stated in 5-7-2, it will be necessary for there to be a transfer of technology as much of the technology is new to Kyrgyz, and it is confidently expected that they will proceed to acquire that technology and make it their own. And although there has been limited accumulation of advanced computer assets, it is also expected that the Kyrgyz personnel will be able to learn and work with new technology.

It is exceedingly important that appropriate technical guidance be provided from advanced industrialized countries to the Kyrgyz personnel who are to be the central agents of action, and are to be given assistance in technical and managerial aspects.

- (2) **Technical Persons Are Few in Number and Scattered; It Is Necessary to Payment systemtrate Them**

At present, the number of persons in banking in Kyrgyz who are using computer-related technology are quite limited. If all the such persons at NBK and the commercial banks are count they total no more than several dozen. They work at their own banks, on the information systems of each bank.

There is a strong possibility that in developing a somewhat improved bank system, even if all these persons were mobilized, they may not be enough.

In carrying out the plan for improvement of the bank payment system, that is to be part of the infrastructure for the society and economy of Kyrgyz, it will not do for the technical capability possessed by Kyrgyz to be in disperse locations. It is desirable that these human resources be concentrated, inasmuch as they are to work on a project of national importance. It is therefore desirable that the NBK be the central body in the realization of the plan, and that the commercial banks participate in that work.

(3) Some Banks May Be Able to Proceed On Their Own

Whilst the improvement of the Kyrgyz bank payment system is to be realized as a joint program, there are some who say that banks may proceed with improvements on their own. Such opinions deserve respect and are welcomed, but it is even more desirable that the priority be given to improvement of a system that is to be commonly used by all banks.

It is important to recognize that even if each bank is to develop its own basic system, first of all the more fundamental, all-Kyrgyz system should be improved, and the systems of the banks should be formed on that basis.

#### **5-7-4 Manufacturers' Maintenance Services**

After the improved bank payment system using a computer network has been installed and is in operation, it is indispensable for its continued use that the manufacturers and suppliers of computers, software, telecommunications lines and equipment provide suitable maintenance service.

There are no computer manufacturers in Kyrgyz at present and very few sales agents. There is only one company engaged in sales, maintenance, and support of hardware and software.

The study team has been informed that several makers of computers have visited Kyrgyz to explain what they have to offer in support of computerization in Kyrgyz.

**There are some companies among them that have already acquired experience in work in Russia and the FSU countries.**

**At this time it is too early, but if a program for improvement of the payment system is implemented, makers of computers and equipment to be used will undoubtedly open offices in Kyrgyz and it is presumed to be possible that realization of the program will be studied on the basis of selection of such a company.**

## **Chapter 6    Establishing a Social and Economic Outline of the Kyrgyz Republic Through the Year 2000**



## **Chapter 6      Establishing a Social and Economic Outline of Kyrgyz Republic Through the Year 2000**

### **6-1      Basic outline**

In Kyrgyz Republic, the basic social and economic system is in flux. As mentioned in Chapter 3, moreover, the credibility of statistics is currently not very high. Accordingly, it is extremely difficult to forecast Kyrgyz situation through the year 2000 using figures alone. However, to create a system that is based on the quantities of financial transactions and payments, it is necessary to approximate that situation, as those quantities are predicated on it. Two possible outlines of Kyrgyz's social and economic development through the rest of this century, Plan A and Plan B, are presented below. In a later chapter, both plans will be discussed in terms of their application.

In early July, 1994, the Kyrgyz government issued forecasts for the country's development through the year 2000 (1994-6, 2000). As pointed out by President Akayev, those forecasts were drawn up by the State Commission on Economy, which, in the process, took into account the various policies that are now being carried out, as well as planned policies for building a financial and payment system in the future. Below, reference is made to those forecasts where appropriate.

The basic features of Plan A and Plan B are as follows.

#### **Plan A**

In this plan, the situation through the year 2000 is forecast based on Kyrgyz natural conditions, its current situation, particularly economic trends in the latter half of 1994 and other past trends. The figures forecast are close to those in the above-mentioned government forecasts, although somewhat more conservative than Plan B. According to this plan, only part of the scenario for economic recovery and development mentioned in Chapter 3 is attained.

#### **Plan B**

This plan is regarded as target figures and more optimistic than the government's forecasts. It is devised, essentially, on the same basis as Plan A. However, it assumes, among other things, that the GDP will recover to where it was in 1990, just before the economy turned downwards. With hard work by the government and the people,

recovery to the economic levels prior to Independence is not an impossibility, so it is appropriate, to a certain extent, to accept the peak level figures as reasonable forecasts. According to this plan, the scenario for economic recovery and development mentioned in Chapter 3 is attained fully, without any major difficulties. It is also possible to see the forecasts in this plan as forecasts for a real picture that take into account economic factors that do not appear in official statistics such as activities in the underground economy.

## 6-2 The forecast figures in the plans

The figures forecast (calculated) for each aspect of the plans are shown below and in Table 6-1, 6-2, 6-3. A brief explanation and the premises of the forecasts is provided thereafter.

In contrast to the information in Chapter 3, which is based on data obtained through December, 1994, these forecasts are generally based on data obtained in August, 1994.

	Unit	1993	Plan A	2000 Plan B	Government forecast
Population	Thousand	4,450	4,419	4,652	4,181
Working population	Thousand	2,303	2,438	2,454	2,591
Rate of unemployment	%	6.3	10.0	0.0	4.1
Real GDP (at 1992 prices)	Mil. Som	676.7	690.4	1,092.4	780
Nominal GDP	Mil. Som	5,720	42,779	70,555	48,680
Industrial structure					
Primary industry (agriculture)	%	27.1	30-35	30	n.a.
Secondary industry (mining and manufacturing)	%	43.3	30-35	35-40	n.a.
Tertiary industry (services)	%	29.6	30-40	30-35	n.a.
Number of enterprises	Thousand	32.2	84.0	96.3	n.a.
Agriculture	Thousand	13.4	34.5	39.0	n.a.
Other than agriculture	Thousand	18.9	49.6	57.3	n.a.
Total foreign trade	Mil. Som	4,026	29,945	52,916	36,614
Exports	Mil. Som	1,821	13,475	25,047	18,307
Imports	Mil. Som	2,205	16,470	27,869	18,307
Balance of trade	Mil. Som	-384	-2,995	-2,822	0
Balance of payments	Mil. \$	-132	-22.4	-72.5	n.a.

Note: Data for 1993 is from State Committee on Economy, NBK and State Committee on Statistics.