IV. PAYMENT SYSTEMS

The smooth operation of payment systems promotes the efficiency and effectiveness of the financial system, therefore it is important for the effective implementation of monetary policy. Besides, the contagion possibility of participants' problems to other parts of the financial system through payment systems, increases the importance of payment systems for financial stability. Hence, central banks give full weight to the determination and prevention of possible risks inherent in payment systems.

This section presents current developments related to the Turkish Interbank Clearing-Real Time Gross Settlement System (TIC-RTGS), which has systemic importance, as well as the Electronic Security Transfer and Settlement System (TIC-ESTS) through which primary market transactions of Turkish Government securities are realized, and the Interbank Clearing House (ICH) since cheque usage still maintains its importance.

Box IV.1. Payment Systems Oversight

The oversight of payment and settlement systems is defined by the Committee on Payment and Settlement Systems, which handles payment systems within the Bank for International Settlements (BIS), as a central bank task principally intended "to promote the smooth functioning of payment systems and to protect the financial system from the possible "domino effects" which may occur when one or more participants in the payment system experience credit or liquidity problems".

The main aim of central banks regarding payment systems oversight is to enable the safe and efficient functioning of payment systems. Because of this, payment systems should have a solid legal basis which ensures the safe execution of payment transactions, and mechanisms which control the financial and operational risks that might prevent the system from functioning properly. In addition, in order to have an effective and economically efficient system, it is essential that participants can handle transactions easily with minimum cost.

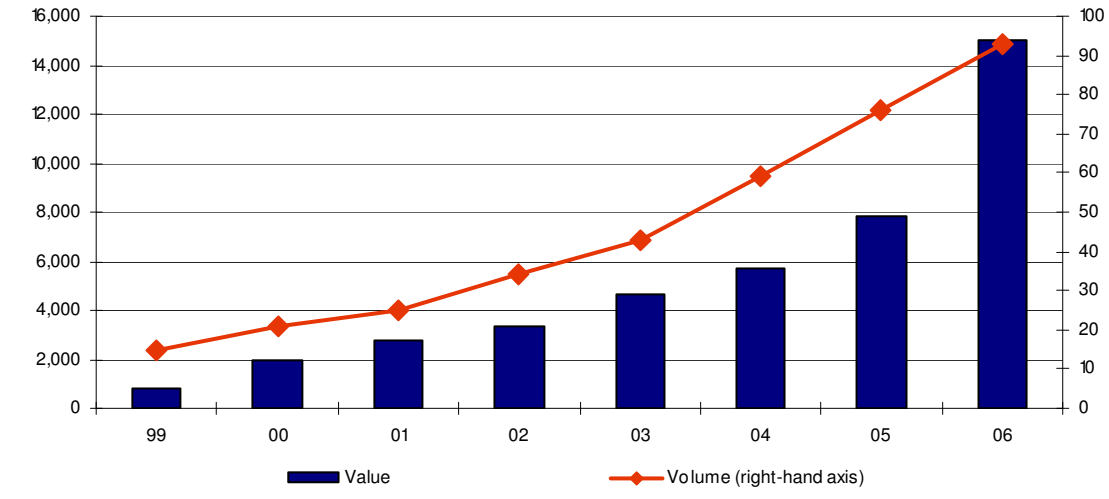
Globally, central banks are furnished with the oversight authority of payment systems via the law. In Turkey, the oversight power of payment systems is provided by the CBRT Law No:1211. Article 4 of the CBRT Law authorizes the CBRT to establish payment and securities transfer and settlement systems and to set forth regulations to ensure the uninterrupted operation and oversight of the existing or future systems. With this authority, the CBRT established TIC-RTGS & ESTS to ensure interbank funds and securities transfer, and based on Law No: 3167 established the Interbank Cheque Clearing Houses Center as a private legal entity to enable the clearing and settlement of cheques. TIC-RTGS & ESTS is operated by the CBRT, however cheque clearing operations are carried out by the ICH under the supervision of the CBRT.

Central banks fulfill their payment systems' oversight task in several ways such as research, assessment and intervention (CPSS Core Principles – January 2001). In the research stage, central banks collect information from statistical data related to payment systems, reports, institutions which operate the system and system participants. Additionally, in this stage, the risks that might arise in the system are determined and scenario analyses are conducted. In the assessment phase, the effectiveness and availability of mechanisms, that will be developed so as to minimize the losses caused by risks, are assessed. In the intervention phase of the oversight operation, the objectives and policies of oversight are publicised and, if necessary, the system principles and working methodology are amended and emergency procedures, which shall enable the completion of an operating day in state of emergency, are prepared.

IV.1. Turkish Interbank Clearing-Real Time Gross Settlement System (TIC-RTGS)

Electronic interbank funds transfer and real time gross settlement of New Turkish Lira payments are realized through the TIC-RTGS, which is owned and operated by the CBRT. The total transaction value of TIC-RTGS reached 26.1 times the annual GNP. In addition, the final settlement of other systems through the TIC-RTGS, as well as its growing usage increases the importance of the system for both financial stability and the Turkish economy.

Chart IV.1.1. Transaction Volume and Value of TIC-RTGS (Million, Billion YTL)



Source: CBRT

In 2006, the transaction value of TIC-RTGS increased by 92.4 percent, while the volume of transactions increased by 22.5 percent (Chart IV.1.1).

Table IV.1.1. Real Time Gross Settlement (RTGS) Systems-Country Comparison

Country – Name of Payment System	2001	2002	2003	2004	2005
Belgium (ELLIPS)					
Transaction Volume (Million)	1.8	1.7	1.8	1.8	1.8
Transaction Value (Billion USD)	12,808	12,573	15,307	18,233	21,448
France (TBF)					
Transaction Volume (Million)	3.8	3.8	3.9	4.0	4.3
Transaction Value (Billion USD)	78,364	86,003	108,750	134,697	151,425
Netherlands (TOP)					
Transaction Volume (Million)	4.1	4.8	4.9	5.0	4.7
Transaction Value (Billion USD)	21,665	23,519	29,669	36,878	38,126
Germany (RTGS-Plus)					
Transaction Volume (Million)	23.9	31.9	32.8	34.1	35.8
Transaction Value (Billion USD)	61,501	117,616	145,123	157,005	172,023
Switzerland (SIC)					
Transaction Volume (Million)	161.1	177.0	192.7	209.1	256.4
Transaction Value (Billion USD)	26,905	28,767	33,202	33,762	32,956
TARGET					
Transaction Volume (Million)	53.7	64.5	66.8	69.4	76.3
Transaction Value (Billion USD)	294,315	373,434	478,474	558,091	613,614
CLS					
Transaction Volume (Million)	-	1.7	19.3	32.6	47.9
Transaction Value (Billion USD)	-	23,790	220,574	379,506	545,838
Turkey (TIC-RTGS)					
Transaction Volume (Million)	25.5	33.9	43.0	58.7	76.4
Transaction Value (Billion USD)	2,446	2,214	3,122	3,986	5,806

Source: BIS, CBRT

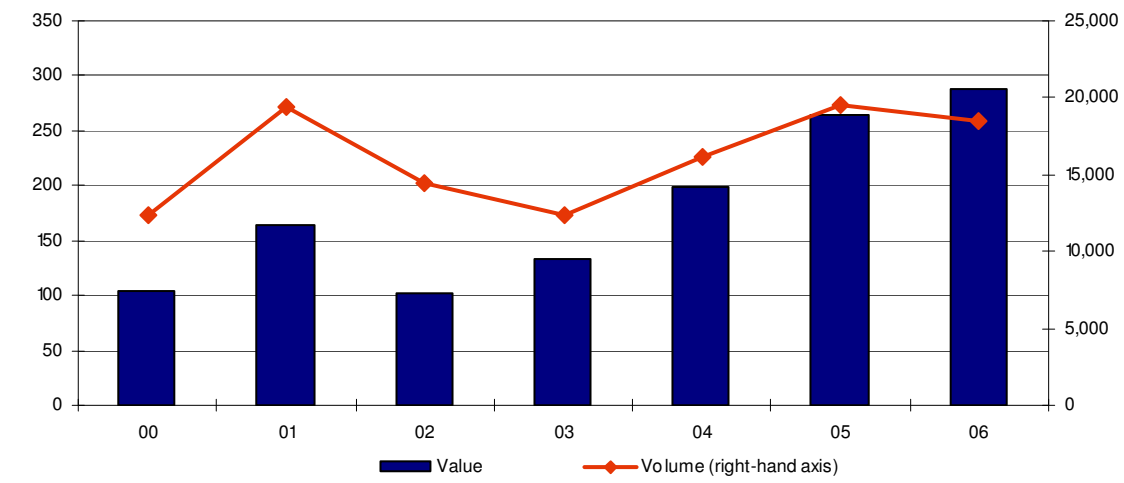
Since no upper and lower limit is defined for the amounts of payment messages, TIC-RTGS, which has 48 participant banks, also allows households and firms to make wide use of the system. Therefore, the volume of transactions in TIC-RTGS is higher than those of many developed European countries, except Switzerland (Table IV.1.1).

The volume and value of transactions of Continuous Linked Settlement (CLS) system, which ensures the final and irrevocable settlement of cross border foreign exchange transactions, continues to increase substantially. The CLS system operates according to the "payment versus payment" principle in order to avoid credit risk. Parallel to international developments, the membership of Turkish currency to this system may be placed on the agenda.

IV.2. Electronic Securities Transfer and Settlement System (TIC-ESTS)

TIC-ESTS, works in an integrated manner with TIC-RTGS to provide electronic, dematerialized and real time transfer and settlement of Turkish government securities among banks with the "Delivery versus Payment" (DvP) principle. The CBRT is both the owner and operator of TIC-ESTS.

Chart IV.2.1. DVP[1] Transaction Volume and Value in TIC-ESTS (Billion YTL)



Source: CBRT
(1) DvP: Delivery versus Payment

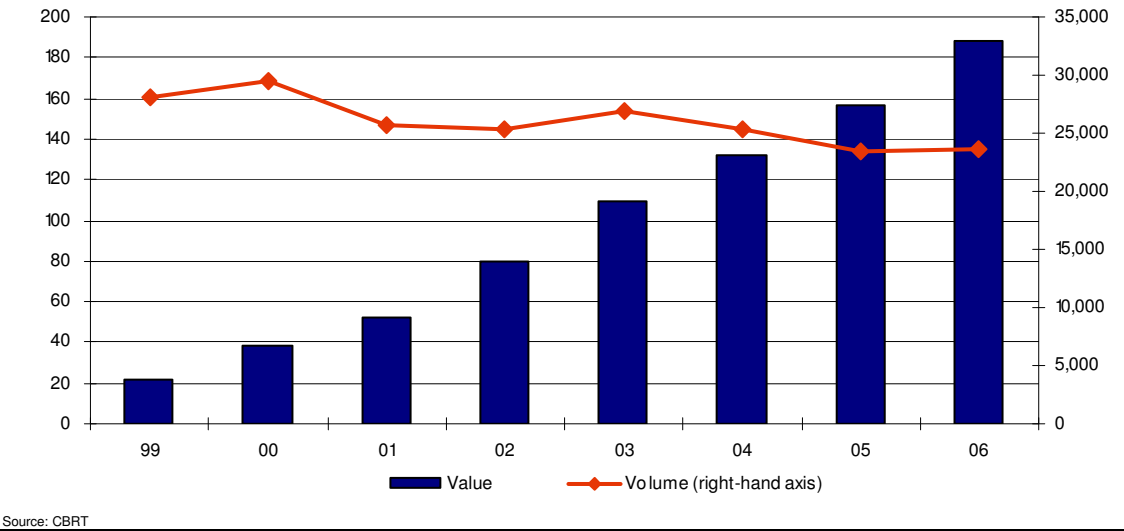
In 2006, the number of DvP transactions in TIC-ESTS decreased by 5.9 percent, while transaction value increased by 9.2 percent compared to the end of the previous year (Chart IV.2.1).

IV.3. Cheque Clearing System

The Interbank Clearing Houses Center, which is established as a legal entity and subject to the provisions of Private Law, provides clearing of cheques and operates under the oversight of the CBRT.

As of year-end 2006, while 9 out of 41 banks participated only in the interbank cheque clearing operations by presenting cheques physically, 32 banks also participated in the operations without physical presentation.

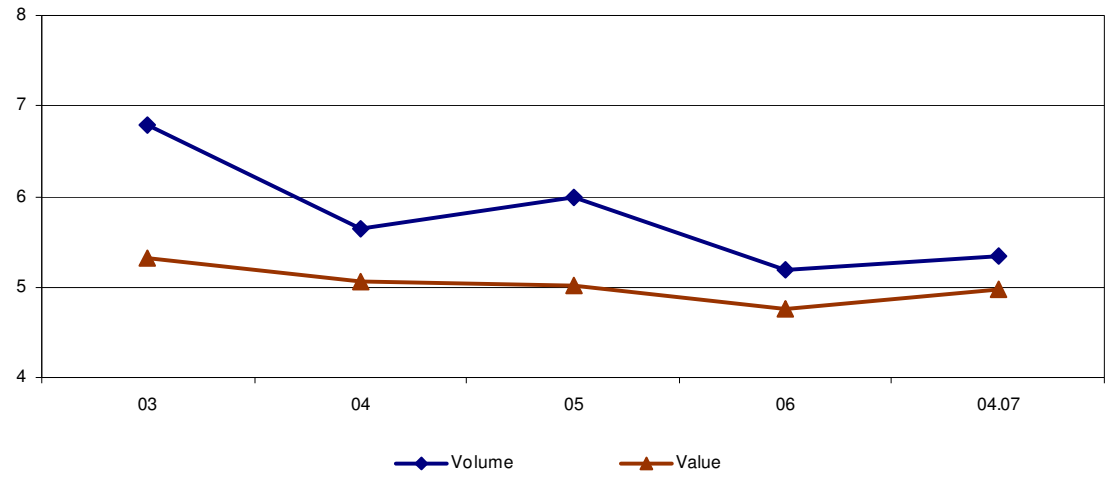
Chart IV.3.1. Volume and Value of Cheques Transacted in ICH (Thousand, Billion YTL)



Source: CBRT

In 2006, the number of cheques, which were subject to the cheque clearing process increased by 0.2 percent compared to 2005, amounting to 23,558 thousand. In the given period, the value of cheques reached 188.3 billion New Turkish Liras, increasing by 20.5 percent. As of the first quarter of 2007, the number of cheques increased by 5.7 percent, amounting to 6,012 thousand, and the value of cheques increased by 21.8 percent, reaching 49.0 billion New Turkish Liras, compared to the same period of 2006 (Chart IV.3.1).

Chart IV.3.2. The Ratio of Volume and Value of Bad Cheques to the Total Cheques Presented to the ICH



Source: ICH

Bad cheques in total cheques presented to ICH is around 5-6 percent and has not changed significantly for years (Chart IV.3.2).

In the cheque clearing system, after the completion of the provision process, participants' debit and credit positions are determined by multilateral netting.

Table IV.3.1. Cheque Clearing System-Netting Ratio

	2003	2004	2005	2006
Netting Ratio (%)	70.42	71.92	71.96	74.79
Transaction Value (Billion TRY)	109.5	131.9	156.2	188.3
Liquidity Saving (Billion TRY)	77.1	94.8	112.4	140.8

Source: CBRT

Since the cheque clearing system operates according to the multilateral netting method, the liquidity requirements of participants derived from cheque transactions is decreasing. The netting ratio of transactions realised through the cheque clearing system increased at end-2006 compared to the previous year. In 2006, thanks to the multilateral netting method, liquidity requirements of participants related to cheque transactions decreased by 140.8 billion New Turkish Liras (Table IV.3.1).

IV.4. Payment Systems Risks

The likelihood of the dispersion of problems derived from system participants to the financial system as a whole via payment systems has increased the importance of payment systems risks. Risks emerging from payment systems can be mainly classified as credit risk, liquidity risk and operational risk.

IV.4.1. Credit Risk

Credit risk is defined as the situation in which participants of payment systems can not meet their obligations either on the due date or subsequently. Problems assessed within the context of credit risk cover the cases in which a participant has permanent and serious problems. The major difference between credit and liquidity risks within the payment systems aspect is that credit risk covers permanent problems while liquidity risk covers temporary ones.

In order to be able to observe the progress of credit risk that participants in the payment system are faced with, their activities, financial statements and capital structures must be regularly monitored. For this purpose, information between the BRSA and the CBRT is regularly exchanged.

In TIC-RTGS, the Real Time Gross Settlement (RTGS) system is used. As is the case in its world implementation, in the TIC-RTGS system, payment orders are realized only if there are sufficient funds in participants' TIC-RTGS accounts at the CBRT. Hence, there is no credit risk deriving from the default in TIC-RTGS.

In TIC-ESTS, transactions are mainly realized according to DvP principles. Since the settlement of delivery and transfer takes place simultaneously, there is no credit risk in these transactions.

The cheque clearing system carries credit risk since there is a possibility that participants cannot fulfill their obligations arising from netting transaction results. In order to eliminate credit risk, the CBRT has the authority to ban failed participants which disrupt settlement, from the system and to finalize netting transactions in the cheque clearing system without the cheques of these participants.

IV.4.2. Liquidity Risk

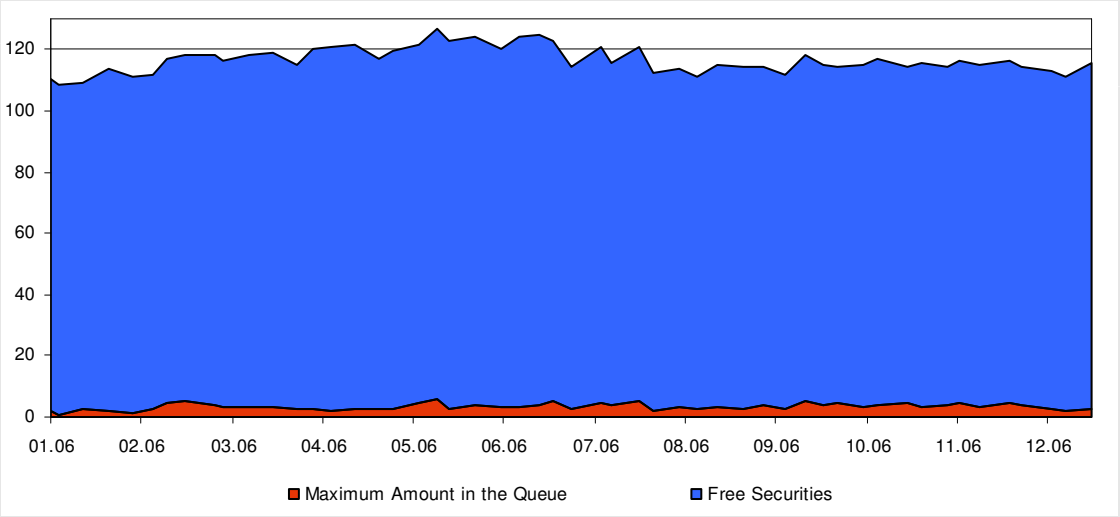
Liquidity risk represents the situation in which a participant cannot fulfill its obligations on the maturity date since it has a temporary liquidity shortage, although it is able to fulfill its obligations in the future. The intraday credit facility, provided to banks by the CBRT, decreases the liquidity risk of payment systems.

Nonetheless, in TIC-RTGS-ESTS systems, there are some features such as adhoc query, queuing of payments and fund management to ensure participants manage their liquidity needs effectively. In the cheque clearing system, participants learn the amount of their obligations which they must fulfill for realization of settlement the previous day when netting transactions finish. This method enables participants to manage their liquidity positions more effectively in cheque clearing transactions.

Box IV.4.2.1. Comparison of Total Amount of Queued Payment Messages at the TIC-RTGS Center with Participants' Free Securities

Banks, which are authorized to carry out transactions in the markets at the CBRT, can obtain liquidity from the CBRT within their limits or from the late liquidity window without any limit against collateral. Considering these facilities, it is examined that if participants cannot fulfill their obligations in the TIC-RTGS system, how much of their obligation can be covered by their free securities. For this purpose, the days on which the total amount of the queued payment messages reached the highest level in a week are chosen, and of these chosen days, the queued payment messages of participant banks are compared with their free securities; which can be used as collateral to get liquidity from the CBRT in case of a temporary liquidity shortage.

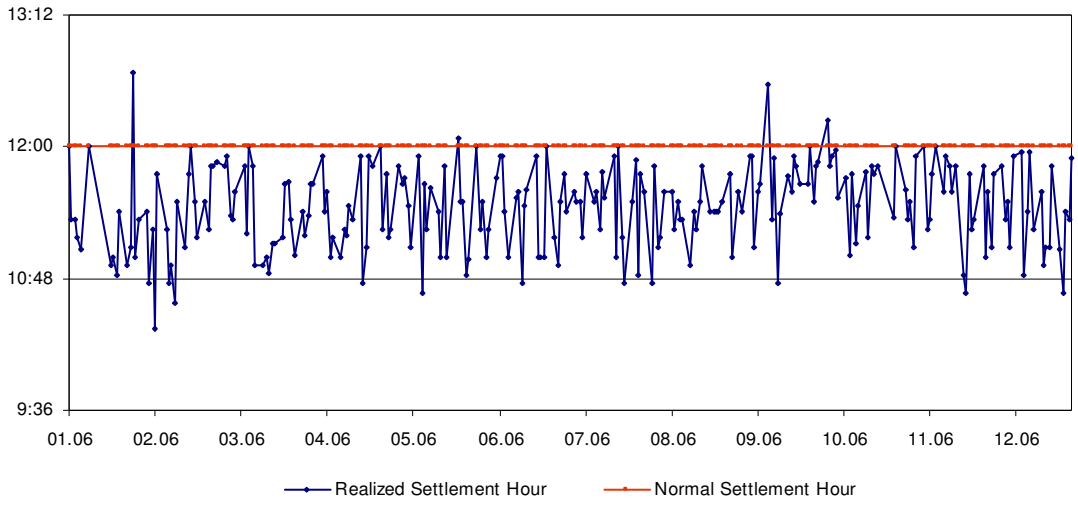
Chart 1. Value of Queued Payments–Participants Free Securities (Government Bonds)[1] (Billion YTL)



Source:CBRT
(1) Free Securities= Securities that are not used as collateral or for repo transactions.

As a result of the analysis, the participants' high level of free securities reduces the liquidity risk arising from the TIC-RTGS system (Chart 1).

Chart IV.4.2.1. Settlement Hours of Cheque Clearing System– 2006



Source: CBRT

In the cheque clearing system, debtor participants that become debtors as a consequence of netting transactions at the end of the day are required to fulfill their obligations on the next day by 12 noon. In 2006, settlement was delayed four times in the cheque clearing system, as participants performed their obligations later than the due time, for a total of 95 minutes (Chart IV.4.2.1). On the other hand, it should be noted that in the cheque clearing system in 2006, the average settlement time was realized at 11:27 a.m.

IV.4.3. Operational Risk

The probability of problems stemming from the operation of the system due to human errors, software-hardware deficiencies, faults or other problems in communication systems is assessed as an operational risk.

TIC-RTGS and TIC-ESTS, which work in an integrated manner, are designed to minimize possible operational problems caused by the system. In case problems cannot be solved or take a long time to solve, the TIC-RTGS-ESTS system is backed up with a Disaster Center in order to provide operational continuity.

In case of a possible breakdown in the TIC-RTGS-ESTS Center, after the decision has been made to use the backup system, it takes at the latest 5 minutes to start with the backup center system. Backup operation of the system is performed simultaneously. While transferring to the backup system, no messages are lost.

The availability ratio, which shows accessibility of the participants to the system during working hours, in other words, the continuity of services, was 99.98 percent on average in 2006 for TIC-RTGS and TIC-ESTS systems (Table IV.4.3.1).

Table IV.4.3.1. Availability Ratios of Payment Systems (2006)

	CHAPS Euro (England)	TARGET	Viber (Hungary)	TIC-RTGS (Turkey)
Availability Ratios (%)	99.96	99.87	99.77	99.98

Source: Bank of England, ECB, Magyar Nemzeti Bank, CBRT

In order to minimize the operational risk deriving from the system, new electronic cheque clearing software started to be used in September 2006, system technology was renewed and a preferential line was installed in the circuit of the cheque clearing system.

In the cheque clearing system, data sent by participants reach the servers in Ankara Interbank Cheque Clearing House, and in one minute at the latest, the same data is also relayed to the servers in İstanbul ICH. Consequently, data is backed up one by one in both Ankara and İstanbul ICHs. In case of any interruption in the Ankara lines or if any other problem occurs with the Ankara servers, all data sent by participants are directed to the Istanbul clearing house. If any problem occurs, the backup system starts to operate automatically, and it is not necessary to make any manual intervention of the system because the preferential line becomes operational.

In addition to these measures, the backup of data is done simultaneously in the Ankara and İstanbul data servers so as to minimize the effects of operational problems in the cheque clearing system.

Box IV.4.3.1. Impact of Operational Failures on Cheque Clearing System

In this scenario, in order to measure the impact of operational problems of participants on the cheque clearing system, the situation is analyzed in which a bank with the highest transaction volume cannot connect to the cheque clearing system all day through due to problems emerging for various reasons in its data lines. Although participants have the opportunity to connect to the system via other alternative channels, within the context of the scenario it is assumed that these alternative ways are not available.

Despite the probability of the scenario occurring is very low, it is thought that this analysis would be useful to measure the potential effects of the problems that participants experience on the system.

With the realization of this scenario as of October 2, 2006, when the highest transaction volume was reached in the cheque clearing system in 2006, the number of cheques which are subject to clearing in ICH, will decrease by 24.4 percent, amounting to 471,705, the value of cheques will be 2,316 million New Turkish Liras with a 21.9 percent decrease, and 152 thousand cheques will not be able to be processed.

In such a case, two participants which are net creditors under normal conditions, become net debtors. The amount of liabilities of the first two participants whose liabilities increase the most, will increase by 181.6 percent and 145.4 percent, respectively. Their liqudity requirement will increase by approximately 14 million New Turkish Liras compared to normal circumstances.

It is determined that in the likelihood of this scenario, borrowing opportunities from both the CBRT and financial markets are sufficient for participant banks which need additional liquidity arising from new conditions.