Payment systems in Japan

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List of abbreviations

ANSER	Automatic answer Network System for Electrical Request
BANCS	Banks Cash Service
BCCS	Bill and cheque clearing system
BOJ-NET	Bank of Japan Financial Network System
CAFIS	Credit and Finance Information System
CAPTAIN	Character and Pattern Telephone Access Information Network
CAT	Credit authorisation terminal
CMS	Cash Management Service
DDX	Digital data exchange
FB	Financing bill
FB	Firm banking
FSA	Financial Services Agency
FXYCS[1]	Foreign Exchange Yen Clearing System
JASDEC	Japan Securities Depository Centre
JB Net	Japan Bond Settlement Network
JGB	Japanese government bond
JSDA	Japan Securities Dealers Association
MICS	Multi Integrated Cash Service
NCL	Net credit limit
PTS	Proprietary trading system
RC	Relay computer
SPDC	Simultaneous processing of DVP and collateralisation
TB	Treasury bill
TBA	Tokyo Bankers Association
TIFFE	Tokyo International Financial Futures Exchange
Zengin System	Zengin Data Telecommunication System

[1] The abbreviation of the Foreign Exchange Yen Clearing System has been changed from FEYCS to FXYCS.

Introduction

There are four major payment systems for clearing and settling interbank payments in Japan - three clearing systems in the private sector and a funds transfer system operated by the central bank. The three clearing systems are: the Zengin Data Telecommunication System (Zengin System), which clears retail credit transfers; the Foreign Exchange Yen Clearing System (FXYCS), which clears mainly yen legs of foreign exchange transactions; and bill and cheque clearing systems (BCCSs), which clear bills and cheques presented at regional clearing houses. The BOJ-NET Funds Transfer System is the central bank's funds transfer system and is used to settle interbank obligations including net obligations of participants in the private sector clearing systems.

There have been several notable developments in the respective payment systems in this decade. Both the Zengin System and the FXYCS have introduced countermeasures against credit and liquidity risks involved in clearing and settlement procedures, and the Bank of Japan Financial Network System (BOJ-NET) introduced a new real-time gross settlement (RTGS) system in 2001.

Concerning securities settlement systems, the Bank of Japan serves as the central securities depository (CSD) for Japanese government bonds (JGBs), and the Japan Securities Depository Centre (JASDEC) is the CSD for stocks. A number of registrars and the Japan Bond Settlement Network (JB Net) make up the settlement system for corporate and other bonds. Delivery versus payment (DVP) has been available for JGBs, corporate and other bonds, and exchange-traded stocks.

In recent years, reform of the securities settlement systems has been proceeding and significant and wide-ranging progress has been made. In terms of the legal framework, a new law was enacted in 2002 enabling the dematerialisation of JGBs, corporate and other bonds, and commercial paper (CP) from 2003. JGBs and CP are scheduled to be settled through new book-entry systems that will operate under the new law from 2003. DVP will also be achieved for CP in the new book-entry system. A unified central counterparty (CCP) for exchange-traded stocks will start operation in 2003, and the introduction of a DVP mechanism for stocks traded outside the exchanges in 2004 has been agreed among the relevant parties. In addition, the use of trade or pre-settlement confirmation systems is expected to become available for broader types of securities.

In retail payments, the predominance of cash for small-value payments and the almost complete absence of cheque use by individuals are the prominent features that distinguish payment practices in Japan. Electronic funds transfers, including services such as prearranged direct debits for the payment of utility bills and direct credits for the payment of payrolls, are widely used by both firms and individuals. Credit cards are commonly used while the use of electronic money and debit cards is very limited. Postal accounts and postal giro services provided by the government-run Post Office are also popular.

With regard to access channels for various retail payment services, new channels such as the internet and mobile phones, as well as existing channels such as bank windows and automated teller machines (ATMs), are used. Convenience stores have also become popular locations for paying utility bills.

1. Institutional aspects

1.1 General institutional framework

1.1.1 Legal and regulatory framework

There is no uniform or comprehensive law in Japan that governs payment and securities settlement. Rather, a number of laws combine to form the legal basis for payment and securities settlement.

With regard to the regulatory authorities, most of the relevant laws governing a variety of financial sector matters specify the Prime Minister as the minister in charge. These include regulation and supervision in the areas of payment and securities settlement. In practice, the Prime Minister delegates authority to the Commissioner of the Financial Services Agency (FSA) based on the provisions of the relevant laws. In addition, the Minister of Finance is in charge of matters related to

JGBs. The Minister of Justice is also responsible for the legal rules governing the book-entry transfer of securities, because these rules constitute a part of civil and commercial law.

The Bank of Japan Law stipulates that, in addition to regular business prescribed by Article 33, such as deposit taking and funds transfers (the basic business component of the BOJ-NET Funds Transfer System), the Bank may, upon receiving authorisation from the Prime Minister and the Minister of Finance, conduct business (carried out in conjunction with its prescribed regular business) that contributes to the smooth settlement of funds. This includes operation of the FXYCS and the JGB Book-entry System. In addition, the Bank oversees the payment and settlement systems in the private sector to achieve its objective, as stipulated in Article 1 of the Bank of Japan Law, namely "to ensure smooth settlement of funds among banks and other financial institutions, thereby contributing to the maintenance of an orderly financial system".

While operators of the private sector clearing systems for interbank payments (ie bankers' associations) are subject to supervision as public interest incorporated associations under the Civil Code, institutions related to securities settlement such as CCPs, CSDs and stock exchanges are regulated and supervised by the relevant ministers such as the Prime Minister.[2]

1.1.2 Legal basis for payment

There is no law that specifically governs electronic funds transfers or paper-based payments in Japan. Rights and obligations regarding individual payments are governed by individual contractual relationships and general private laws such as the Civil Code and the Commercial Code.

Regarding means of payment, banknotes issued by the Bank of Japan and coins issued by the government receive the status of legal tender under the Bank of Japan Law and the Unit of Currency and Issuance of Coins Law respectively. Paper-based means of payment such as bills and cheques, which utilise deposits for payment, are governed by the Bill Law and the Cheque Law. In addition, prepaid cards, whose features are relatively close to those of electronic money, are governed by the Prepaid Card Law.

With respect to deposits, the Capital Subscription Law stipulates that, in order to take deposits, an institution must be authorised to do so under other laws. Specifically, only certain categories of institution are allowed to take deposits and conduct funds transfers: for example, banks are allowed to do so under the Banking Law, while other types of financial institution do so under the respective laws governing them in this regard (eg *shinkin* banks under the Shinkin Bank Law).

Postal savings, postal giro and postal money orders are governed by the Postal Savings Law, the Postal Giro Law and the Postal Money Order Law respectively.

1.1.3 Legal basis for securities settlement

The current laws regarding JGBs, stocks and corporate and other bonds support the immobilisation and/or dematerialisation of securities and book-entry transfers, while the applicable laws differ according to the type of security. Effective from January 2003, the Law Concerning Book-Entry Transfer of Corporate and Other Debt Securities (hereafter the Transfer of Corporate Debt Securities Law) will enable dematerialisation and establishment of multi-tiered book-entry systems for various types of debt securities including JGBs, corporate bonds and CP.

Under these laws as well as general private laws such as the Civil Code and the Commercial Code, legal title and interests in securities are transferred or perfected via: (1) delivery of certificates for physical securities; (2) change of the securities holders' names on the books of registrars for registered securities; or (3) credits and debits to accounts on the books of the CSD and participants for book-entry securities.

[2] The legal framework for regulation and supervision of CCPs for securities trades and CSDs for debt securities will be introduced in January 2003 pursuant to the relevant laws.

1.1.4 Enforceability of netting arrangements

Payment netting is a legally accepted means for counterparties to agree to fulfil their obligations. Novation netting is also considered effective and enforceable in the case of a counterparty's default.

The Law Concerning Closeout Netting of Specified Financial Transactions Entered into by Financial Institutions ensures that closeout netting of specified types of financial transactions (derivatives transactions, cash-collateralised securities lending and repurchase agreements) between two counterparties is enforceable under insolvency proceedings.

1.2 The role of the central bank

The Bank of Japan, Japan's central bank, was founded in 1882. Article 1 of the Bank of Japan Law stipulates that the Bank's objectives are to issue banknotes, to carry out currency and monetary control and to ensure the smooth settlement of funds among banks and other financial institutions, thereby contributing to the maintenance of an orderly financial system. To achieve these objectives, the Bank of Japan provides various payment and settlement services such as the provision of means of payment (ie banknotes and deposits in current accounts held with the Bank) and the operation of the BOJ-NET as the central bank's online payment and JGB settlement systems. The Bank of Japan also oversees the payment and settlement systems in the private sector. The responsibilities of the Bank of Japan in the field of payments and settlements are explained in the subsections below.

1.2.1 Issuance of banknotes

The Bank of Japan is the sole issuer of banknotes in Japan and banknotes are given the status of legal tender under the Bank of Japan Law. In other words, they must be accepted by any creditor in satisfaction of any debt except when otherwise agreed by both the debtor and the creditor.

Banknotes issued by the Bank of Japan incorporate various anti-counterfeiting features. In recent years, however, counterfeiting has increased sharply in major countries including Japan, and the Bank actively exchanges information and conducts joint studies with other central banks. In order to improve security against counterfeiting, it was decided in August 2002 to introduce a new series of the Bank of Japan notes (10,000 yen, 5,000 yen and 1,000 yen notes[3]) in the first half of fiscal year 2004.

1.2.2 Provision of payment and settlement services

1.2.2.1 Payment through current accounts

Financial institutions' deposits in current accounts at the Bank of Japan are used for a number of purposes including serving as settlement assets for interbank obligations. At the end of 2001, 667 institutions, including banks, securities companies and bankers' associations as operators of private payment systems, held current accounts with the central bank. The Bank of Japan has been operating an online payment system, the BOJ-NET Funds Transfer System, since 1988 to process funds transfers between financial institutions through the central bank accounts (see Section 3.5).

The Bank of Japan provides current account services to financial institutions that meet certain criteria, which were made public in 1998. These criteria specify that, to open a current account with the Bank, applicants need to be in sound financial condition in terms of capital adequacy, have appropriate operational capability, and must enter into a contract with the Bank, under which they agree to undergo on-site examinations conducted by the Bank, based on Article 44 of the Bank of Japan Law. In addition, for securities companies, sufficient standing in securities markets is required.

The Bank of Japan has been providing intraday overdrafts to facilitate the smooth settlement of funds through the central bank accounts on an RTGS basis since the beginning of 2001 under Article 33 of the Bank of Japan Law. Separately, the Bank of Japan may extend loans to financial institutions

[3] The 2,000 yen note, first issued in July 2000, has already incorporated more advanced anti-counterfeiting features than the current 10,000 yen, 5,000 yen and 1,000 yen notes.

experiencing liquidity constraints, in its role as the lender of last resort, under Articles 33, 37 and 38 of the Bank of Japan Law.

1.2.2.2 Settlement of JGB transactions

The Bank of Japan has been providing services for registration of JGBs since 1906, as the sole registrar under the Law Concerning Government Bonds. In 1980, the Bank of Japan established the JGB Book-entry System, in which the Bank serves as the depository, to promote the sound development of the JGB secondary market. In 1990, the Bank of Japan introduced an online system, the BOJ-NET JGB Services, to process transfer registrations and book-entry transfers of JGBs (see Section 4.2).

The Bank of Japan made public the Requirements for Admission as a Participant in the JGB Book-entry System in 2001 with a view to further enhancing the transparency of the administration of the JGB Book-entry System. These requirements specify that, to be participants in the system, applicants need to be in sound financial condition in terms of capital adequacy and have appropriate operational capability.

1.2.3 Oversight

Major private clearing systems play an important role in Japan's overall payment system. For instance, while the daily average of transactions settled in the BOJ-NET Funds Transfer System was JPY 77 trillion (USD 634 billion) in 2001, the value of transactions handled by the FXYCS and the Zengin System averaged JPY 28 trillion (USD 230 billion) and JPY 10 trillion (USD 82 billion) respectively.

In view of the systemic importance of the major clearing systems, the Bank of Japan recognises that activities which it conducts in its capacity as overseer of the nation's payment and settlement systems are essential for promoting their safety and efficiency. The Bank also oversees securities settlement systems as a whole, paying particular attention to their funds clearing aspects, not only because of the close relationship between these and payment systems but also because of their size in both volume and value terms. These securities settlement systems include CCPs, CSDs and other related arrangements for securities settlement.

To ensure the safety and efficiency of Japan's payment and settlement systems, the Bank of Japan collects and analyses relevant information including statistical data, reviews and assesses the design and operation of each system, and encourages improvements in payment and settlement systems. The Bank of Japan, where necessary and appropriate, makes changes to the BOJ-NET to facilitate improvements in these systems.

The Bank of Japan currently oversees the payment and settlement systems in the private sector, based on the international standards set forth in the Core Principles for Systemically Important Payment Systems by the Committee on Payment and Settlement Systems (CPSS) of the central banks of the Group of Ten countries, and in the Recommendations for Securities Settlement Systems by the CPSS and the Technical Committee of the International Organization of Securities Commissions (IOSCO), both of which were made public in 2001. In addition, the Bank participates in central banks' cooperative oversight activities where relevant for the safe and efficient settlement of the currency it issues.

In recent years, for example, as part of its oversight activities the Bank of Japan encouraged the FXYCS and the Zengin System to introduce the necessary risk reduction measures on the basis of the Lamfalussy Standards[4] (see Section 3). The Bank also encouraged the introduction of a DVP mechanism for transactions involving corporate and other bonds as well as exchange-traded stocks, based on the Group of Thirty's 1989 standards[5] (see Section 4).

The major policies and role of the Bank of Japan with respect to oversight are explained in "The role of the Bank of Japan in payment and settlement systems", published in 2002.

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[4] *Report of the Committee on Interbank Netting Schemes of the central banks of the Group of Ten countries*, BIS, 1990.

[5] *Clearance and settlement systems in the world's securities markets*, Group of Thirty, 1989.

1.2.4 Examination and monitoring

The Bank of Japan conducts on-site examinations and off-site monitoring of the financial institutions that hold current accounts with it. In on-site examinations, in addition to analysing various issues such as asset quality and profitability of financial institutions, the Bank evaluates the reliability and security of computer systems and the management of settlement risks arising from participation in payment and settlement systems or from provision of settlement services to other financial institutions. Also, a number of issues associated with settlement activities, including financial institutions' management of their daily liquidity and the total value of securities eligible as collateral for the Bank's credit extension, are covered in off-site monitoring. These monitoring functions also contribute to the Bank's performance of a number of its other duties including the conduct of monetary policy as well as ensuring the smooth functioning of the overall payment and settlement system.

1.2.5 Treasury funds operations

On behalf of the central government, as well as handling JGB-related services such as issuance and payment of principal and interest, the Bank of Japan receives and disburses treasury funds pursuant to the Bank of Japan Law and the Public Accounting Law. For example, the Bank receives payments of national taxes and social security premiums from the general public, either indirectly via financial institutions acting as its agents[6] or directly at its offices, and the collected funds are deposited in the government account. Treasury funds, including payments for public works projects and pensions, are also disbursed to the general public by the Bank in a similar manner.

The Bank of Japan provides accounting services for government deposits held with the Bank. The Bank also sorts and calculates receipts and disbursements of treasury funds for government agencies and specific government accounts.

1.3 The role of other private and public sector bodies

1.3.1 Providers of payment services

1.3.1.1 Banks

As well as offering a variety of payment services, banks, together with bankers' associations, cooperate in establishing and managing interbank clearing systems such as BCCSs, the Zengin System and the FXYCS. Also, to meet strong public demand for cash from depositors, banks provide a nationwide network of automated teller machines (ATMs). In addition, banks provide direct debit and direct credit services, and issue debit cards.

There were seven city banks, 64 regional banks, 56 member banks of the Second Association of Regional Banks, 73 branches of foreign banks in Japan, two long-term credit banks, 29 trust banks, 621 financial institutions serving mainly small businesses[7] and individuals, and 1,697 financial institutions serving mainly the agriculture and fisheries sector[8] in Japan as of April 2002.

1.3.1.2 New types of banks

As use of the internet and mobile phones has become widespread and customer needs diversified, new types of banks have emerged, such as internet-only banks and also a bank that specialises in ATM services. Non-financial entities are one of the major drivers of these new banks.

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[6] With the approval of the government, the Bank of Japan makes agency contracts with financial institutions, allowing designated branches of these institutions to act as its agents for the collection and disbursement of government funds.

[7] Financial institutions that focus on lending to small businesses, including Shinkin Central Bank, *shinkin* banks, Shoko Chukin Bank, Shinkumi Federation Bank, credit cooperatives, National Federation of Labour Credit Associations and labour credit associations.

[8] Financial institutions that concentrate on lending for agriculture and fisheries, including Norinchukin Bank, agricultural cooperatives and fishery cooperatives.

The Financial Reconstruction Commission and the FSA responded to the establishment of these new types of banks by formulating Measures for Licensing and Supervision of New Types of Banks including Entry into Banking Business by Non-Financial Entities (Operational Guidelines) in August 2000. Also, the Banking Law was amended in November 2001 so as to govern the entry of non-financial entities into the banking business by regulating the major shareholders of the banks.

1.3.1.3 Non-banks

In certain respects, non-banks such as securities companies, insurance companies, credit card companies, consumer credit companies and retailers compete with banks in providing payment services. For example, non-banks have installed ATMs and issue various cards. Retailers, public transportation companies and telephone companies issue prepaid cards, and consumer credit companies and retailer affiliates issue credit cards.

At the same time, non-banks also cooperate with banks. For instance, securities companies provide a service whereby once the balance of a customer's demand deposit account at a bank reaches a preset level, any additional inflow of funds to the account will automatically be transferred to the customer's mutual fund investment account at a securities company. If the balance of the demand deposit account falls below the preset level, the shortage will automatically be made up by transferring sales proceeds from the customer's mutual fund investment account.

1.3.1.4 Japanese Bankers Association

The Japanese Bankers Association consists of banks and regional bankers' associations. At the end of 2001, there were 141 full member banks, 46 associate member banks and 72 special members (bankers' associations).[9]

One of the roles of the Japanese Bankers Association is to enhance the safety and efficiency of the industry's payment procedures by establishing market practices and standards. Examples of these market practices and standards are as follows: (1) Market Practices for Real-Time Gross Settlement for money markets, including payment practices for those market transactions; (2) "model contracts" for customer accounts, remittances and letters of credit; (3) standard operating procedures for direct debit, domestic funds transfers, government funds and custody operations; (4) certificate formats for bills, cheques, bonds and other securities; (5) formats for magnetic tapes, floppy disks and smartcards (Zenginkyo IC Cash Card Specification); and (6) online data exchange protocols (Zenginkyo data transmission protocol).

1.3.1.5 Tokyo Bankers Association

The Tokyo Bankers Association (TBA) is the largest of Japan's 72 regional bankers' associations. The TBA is an incorporated association and has full-time employees, while the Japanese Bankers Association is an unincorporated association for which the TBA functions as the secretariat.

The TBA operates clearing systems such as the Tokyo Clearing House, the Zengin System and the FXYCS. The TBA is the secretariat for interbank ATM network systems such as the Banks Cash Service (BANCS) and the Multi Integrated Cash Service (MICS). Also, the TBA chairs the Society for Worldwide Interbank Financial Telecommunication (SWIFT) user group in Japan.

1.3.1.6 Other regional bankers' associations

The core business of the other 71 regional bankers' associations is to conduct bill and cheque clearing among their member banks.

1.3.1.7 Post Office

The Japanese government started providing postal services as governmental non-profit services in 1871. After the reform of central government ministries and agencies in January 2001, the Postal

[9] Membership dues for associate members are lower than those for full members, and there are some restrictions on voting rights of associate members.

Services Agency was established as an external agency of the Ministry of Public Management, Home Affairs, Post and Telecommunications for the purpose of providing these postal services.

Besides financial services such as postal savings, postal insurance and pensions, the Post Office provides payment services that utilise its transferable deposit accounts, with a nationwide network of approximately 24,000 post offices (banks had approximately 14,000 branches at the end of March 2002).

At the end of 2001, the outstanding amount of postal savings totalled JPY 240 trillion (USD 1.8 trillion), while the outstanding amount of bank deposits totalled JPY 589 trillion (USD 4.5 trillion).[10]

The Postal Services Agency is scheduled to transfer its business to the Japan Post, a newly established government-owned public corporation, in April 2003.

1.3.2 Providers of securities settlement services

1.3.2.1 Securities companies

Securities companies provide various kinds of securities-related services such as dealing, brokerage, underwriting and public offering and distribution of securities in both primary and secondary markets. In order to engage in securities business, securities companies must be registered with the Prime Minister. At the end of 2001, there were 291 securities companies including 50 foreign securities companies in Japan.

1.3.2.2 Banks

According to the provisions of the relevant laws, such as the Banking Law, banks are permitted to engage in certain securities-related services. These include securities lending services, custody services and the underwriting and selling of government and other public debt securities. In addition, a number of banks function as designated registrars under the Law on Registration of Corporate and Other Bonds. Registrars also function as pre-settlement service institutions providing the necessary services for corporate and other bonds in advance of settlement, such as examining the content of the instructions, assigning bond serial numbers if necessary, rearranging the order of settlement instructions and checking the balances of sellers' accounts.

1.3.2.3 Japan Bond Settlement Network

The Japan Bond Settlement Network Co Ltd (JB Net) operates an online network system which links participants (investors and dealers), registrars and the Bank of Japan for funds transfers, thereby facilitating the smooth transfer of corporate and other registered bonds, including corporate bonds, government-guaranteed bonds and municipal bonds. JB Net functions as the intermediary in this online network system. JB Net was established by financial institutions including banks, securities companies, investment companies and insurance companies in 1996, and started operation in 1997. There were 453 direct participants, 424 indirect participants and 37 pre-settlement service institutions at the end of 2001.

1.3.2.4 Japan Securities Depository Centre

The Japan Securities Depository Centre (JASDEC) was established as the CSD for stocks and started operation in 1991, under the Law Concerning Central Depository and Book-Entry Delivery for Share Certificates and Other Securities. Based on the amendment of the law in 2001, JASDEC changed from an incorporated foundation into a joint stock corporation in June 2002. At the end of 2001, JASDEC had 294 participating institutions, including securities companies, banks, stock exchanges and the TBA, and 3,594 Japanese companies entrusted JASDEC with the handling of their stocks.

[10] Deposits held with domestically licensed banks and *shinkin* banks.

1.3.2.5 Stock exchanges

There are five stock exchanges in Japan: the Tokyo Stock Exchange, Osaka Securities Exchange, Nagoya Stock Exchange, Fukuoka Stock Exchange and Sapporo Securities Exchange.

The Tokyo Stock Exchange and the Osaka Securities Exchange were originally founded in 1878 and re-established in 1949. Following an amendment of the Securities and Exchange Law that allowed stock exchanges to transform their corporate structure, the Osaka Securities Exchange and the Tokyo Stock Exchange changed from a membership organisation to a joint stock corporation in April and November 2001 respectively, with a view to improving their international competitiveness. The Nagoya Stock Exchange also became a joint stock corporation in April 2002.

The Tokyo Stock Exchange and the Osaka Securities Exchange predominate in terms of both volume and value traded. The Tokyo Stock Exchange dominates listed stock and convertible bond trades, and the Osaka Securities Exchange lists Nikkei Average Futures, the most actively traded stock index futures in Japan.

1.3.2.6 Japan Securities Dealers Association

The Japan Securities Dealers Association (JSDA), formed under the Securities and Exchange Law, aims to ensure that purchases and sales of securities take place fairly and smoothly, thus contributing to the protection of investors. It established an OTC market for securities and serves as a self-regulatory organisation. In addition, the JSDA took the lead in establishing the Japan OTC Securities Co, Ltd - the present Jasdaq Market, Inc - to facilitate OTC securities trading. The JSDA also coordinates OTC market practices, including settlement practices. For example, the JSDA has laid out Guidelines for Real-Time Gross Settlement of Government Securities Transactions. Furthermore, the JSDA functions as the industry association for securities dealers. There were 291 securities company members and 233 special members (registered financial institutions, consisting of banks, insurance companies, money market brokers and securities finance companies) at the end of 2001.

1.3.2.7 JASDAQ market

The JASDAQ market is an OTC stock market managed by the JSDA. Shares of stocks registered with the JSDA that meet certain standards are traded in the JASDAQ market under JSDA regulations. In the JASDAQ market, stocks are traded over the JASDAQ system, which is a trading network system connecting securities companies, information vendors, the JSDA and Jasdaq Market, Inc, to which the JSDA has consigned relevant operations. Jasdaq Market, Inc has been functioning as the CCP for the JASDAQ market since 2001.

1.3.2.8 Proprietary trading systems

In 1998, it became possible to conduct trading of listed securities outside the exchanges following an amendment to the Securities and Exchange Law whereby dealers were no longer required to funnel orders to the exchanges. At the same time, the operation of a proprietary trading system (PTS) - an electronic system whose functions are similar to those of the exchanges - was recognised as a form of securities business requiring approval from the Prime Minister. Based on this amendment to the law, securities companies started providing electronic trading services for JGB transactions in June 2000. At the beginning, only a limited number of PTSs were approved. With the revision of PTS approval standards, which came into effect in December 2000, some more PTSs were approved.

1.3.3 Other service providers

1.3.3.1 Tokyo International Financial Futures Exchange

The Tokyo International Financial Futures Exchange (TIFFE) was established in 1989 as a non-profit, membership-based organisation under the Financial Futures Trading Law, mainly to provide trading instruments for short-term interest rate futures.[11]

Banks, securities companies, insurance companies, branches of foreign banks and foreign securities companies in Japan, as well as other financial institutions participate in TIFFE. There were 70 clearing members and 29 general (non-clearing) members as of December 2001. The former settle transactions on behalf of the latter, using the designated settlement banks for payment.

TIFFE provides in-house clearing services, in which it functions as the CCP for futures transactions. Members' positions are marked to market every day, and the variation margin is settled on the following day.

Procedural steps for the settlement of funds are as follows: (1) TIFFE calculates each clearing member's variation margin and notifies each of their designated settlement banks of the necessary information for the settlement of funds; (2) each settlement bank transfers funds from the accounts of clearing members with net debit positions to TIFFE's account (with the settlement bank), and then transfers funds from TIFFE's account to those of clearing members with net credit positions; and (3) when funds transfers between settlement banks are necessary, they are processed through the BOJ-NET Funds Transfer System on an RTGS basis at 12:00, transferring funds from the accounts of settlement banks in surplus to the account of TIFFE, and then from the account of TIFFE to the accounts of the settlement banks with shortages.

TIFFE requires its clearing members to make loss compensation deposits in addition to margin and membership deposits. If a non-clearing member fails to meet an obligation, the clearing member needs to settle the transaction on its behalf; if a clearing member fails to meet an obligation, TIFFE provides liquidity to its account held with a settlement bank or with the Bank of Japan in order to complete the settlement. TIFFE is compensated for the loss it incurs by the following: (1) the failed clearing member's margin and deposits with TIFFE; (2) TIFFE's reserves for default compensation; and (3) loss compensation deposits made by the survivor clearing members. For any loss in excess of these funds, the survivor clearing members are required to make additional loss compensation deposits.

2. Payment media used by non-banks

2.1 General overview

This section describes means of payment, instruction instruments and access channels that are used for making retail payments in Japan. While bank deposits are the most widely used means of payment, cash is also very frequently used, particularly for small-value payments. In addition, postal deposits are commonly used for payments. Electronic money is not much in use in practice, but prepaid cards, which have a function similar to electronic money, are very common.

Turning to instruction instruments, the use of non-paper instruments such as direct debits, credit transfers, credit cards and debit cards, which enable account holders to instruct institutions to make payments out of their deposit accounts, has generally been increasing. On the other hand, the use of bills and cheques has been declining.

[11] The following products are currently listed on TIFFE: three-month euroyen futures, three-month euroyen Libor futures, US dollar-Japanese yen currency futures, options on three-month euroyen futures, calendar spreads on three-month euroyen futures and Libor-Tibor spreads. Among these, three-month euroyen futures are most actively traded.

Diversification of access channels has been remarkable in the past few years. In addition to ATM services and firm banking, services provided through new access channels, such as internet banking, mobile banking and convenience store banking, are making steady advances.

2.2 Cash and deposits

2.2.1 Cash

The Bank of Japan has the exclusive authority and responsibility to issue and circulate banknotes. Article 46 of the Bank of Japan Law stipulates that banknotes shall be used as legal tender for payments and that there is no limit to the acceptability of banknotes for payments. Four denominations of banknotes are currently issued under the Bank of Japan Law Enforcement Order: 1,000 yen, 2,000 yen, 5,000 yen and 10,000 yen.[12]

Coins are issued by the Japanese government and put into circulation by the Bank of Japan under the Unit of Currency and Issuance of Coins Law. Article 7 of the Law stipulates that coins must be accepted as legal tender for payment of amounts up to 20 times the face value of the given denomination of coin.[13] Coins come in six denominations - 1 yen, 5 yen, 10 yen, 50 yen, 100 yen and 500 yen - in addition to coins that are specially issued on commemorative occasions.

Cash is used extensively in Japan compared with other industrial countries. The ratio of cash in circulation to nominal GDP, 14.4% at the end of 2001, was the highest among G10 countries. At the end of 2001, banknotes in circulation totalled JPY 69 trillion (USD 525 billion) and coins JPY 4.3 trillion (USD 33 billion). There are three reasons for the high preference for cash in Japan: (1) obtaining cash is not expensive due to highly developed nationwide ATM networks; (2) there is little risk in carrying cash because Japan is a comparatively safe country where crime rates are low; and (3) the public continues to have a high level of confidence in cash as a means of payment because anti-counterfeiting measures have been effective.

2.2.2 Bank deposits

The outstanding amount of demand deposits was JPY 276 trillion (USD 2.1 trillion) and the number of bank accounts for demand deposits stood at 419 million at the end of March 2002.[14]

Deposits in bank accounts are used as a means of payment for instruction instruments such as direct debits, credit transfers, credit cards, debit cards and bills and cheques. Payments made using these instruments have been increasing, partly reflecting the development of a variety of access channels such as ATMs, the internet, mobile phones and convenience stores.

2.2.3 Postal savings

Postal deposits are also used for making retail payments. The outstanding amount of ordinary and transferable postal deposits was JPY 50 trillion (USD 377 billion) and the number of these postal deposit accounts 117 million at the end of March 2002. Payment services using postal accounts include funds transfers,[15] prearranged direct credits, direct debits, debit cards and ATM services.

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[12] In addition to these, there are six denominations of banknotes which are valid though they are not currently issued: 1 yen (USD 0.008), 5 yen, 10 yen, 50 yen, 100 yen and 500 yen.

[13] According to the directives of the Ministry of Finance, there is no limit to the acceptability of coins for payments made to the government, such as taxes.

[14] Demand deposits held with domestically licensed banks and *shinkin* banks.

[15] The number of financial institutions that provide funds transfer services between their accounts and postal accounts was 33 at the end of 2001.

2.3 Electronic money

Various card-based and network-based e-money pilot projects such as Visa Cash have been conducted since 1997, all of which have been confined to specific geographical areas.

Some card-based products have been put into commercial use, although the volume and value of electronic money transactions are negligible compared to those of other means of payment. Mondex launched its service to certain firms in August 2000, combining an employee ID function with e-money that can be used within the office building. E-money called Edy has been available on contactless smartcards since November 2001, and can be used within virtual malls on the internet, a limited number of office buildings, shopping malls and convenience stores.

2.4 Prepaid cards

Prepaid cards are cards that store data regarding the amount paid for the cards and the amount spent so far. They are used for specific services provided by the issuer, and the remaining balance is usually displayed on the card reader during use. The Prepaid Card Law, enacted in 1989, obliges card issuers to deposit funds equivalent to half of the unused value of issued cards with the legal affairs bureaus of the Ministry of Justice in order to protect cardholders, who are the issuers' creditors.

Prepaid cards have spread rapidly in Japan since the 1980s as a means of payment for public telephones and public transportation such as railways, underground railways and buses. Originally, each company issued cards that could be used only for their own services; however, there are some recent examples of a number of service providers sharing the same prepaid card scheme. For example, in October 2000, a number of railway and underground railway companies issued a joint transportation card, which allows passengers to travel on various railway lines using a single card. Telephone cards issued by Nippon Telegraph and Telephone Corporation were very common in the 1980s and early 1990s, but the number is declining due to the increasing popularity of mobile phones.

Most prepaid cards are magnetic cards, but smartcards have also appeared recently. In November 2001, a railway company introduced a contactless and reloadable smartcard for the payment of train fares. This card facilitates the entrance process because passengers are able to pass through ticket gates by simply touching the card reader with the card.

2.5 Direct debits

Prearranged direct debits are intrabank funds transfer arrangements used widely for making a broad range of recurring payments. They were first introduced in 1955 for the payment of telephone bills. They have expanded rapidly since the early 1960s and are now used extensively for the payment of public utility bills, credit card bills, taxes, school tuition, insurance premiums and loan repayments.

Direct debit services are provided on the basis of a tri-party agreement between the payer, the payee and their bank. The payee sends payment instructions to the bank on a paper basis, on magnetic tape or through online transmission. On a designated day, the bank debits the amount instructed from the payer's ordinary deposit account[16] and credits the payee's account.

2.6 Credit transfers

Credit transfers are popular for remitting funds to a payee in a remote location, or for sending large amounts of funds where physical delivery of cash would entail risks. Most credit transfers use electronic funds transfer systems for making intrabank or interbank payments. Interbank credit transfers are processed through private clearing systems such as the Zengin System and sometimes directly through the BOJ-NET Funds Transfer System (see Sections 3.3 and 3.5).

Prearranged direct credits used for the payment of salaries and pensions are an example of such credit transfer services. They are based on a tri-party agreement among the payer, the payee and the

[16] An ordinary deposit is a type of demand deposit against which cheques cannot be drawn. It is estimated that most households in Japan have at least one ordinary deposit account.

payee's bank. In the case of salaries, the firm using the service sends payroll data to its bank, and the bank transfers funds according to the data on the designated day.

2.7 Credit cards

Since the issuance of the first card in 1960, credit cards have become increasingly popular in Japan. The number of credit cards and the value of payments made using credit cards have almost doubled over the past 10 years. There were 232 million cards at the end of March 2001, and the value of payments made by credit cards amounted to JPY 23.3 trillion (USD 192 billion) in 2001. Major issuers of credit cards include bank affiliates,[17] consumer credit companies and retailer affiliates.

In most cases, the Credit and Finance Information System (CAFIS), a system established in 1983 primarily by bank-affiliated credit card companies, carries out the necessary data processing. When a customer presents a credit card to a member merchant, the information on the magnetic stripe is read by a credit authorisation terminal (CAT) and sent to the computer of the credit card company via the CAFIS Centre. The computer checks for lost or stolen cards, verifies credit limits and automatically processes the purchase.

The use of credit cards over the internet for online shopping has started to increase with the development of business-to-consumer electronic commerce, although the volume and value are still very low. Many credit card companies are starting to issue cards that have a wider variety of applications such as financing, cash dispensing and revolving credit facilities.[18] Bank-affiliated issuers are also planning to replace traditional magnetic stripe credit cards with smartcards from 2003, for the purpose of preventing credit card skimming.

2.8 Debit cards

In 1984, Japanese banks began offering the same type of service as today's debit card service under the name "Bank POS". It was not really successful, however, because the service was not very practical for users: debit card users had to apply to the financial institution before using their cash cards as debit cards, and it took 30 to 50 seconds to process a single payment.

Advances in telecommunications technology in the 1990s and deregulation in July 1997 laid the groundwork for the development of today's debit card service. The Japan Debit Card Promotion Council started providing a debit card service called "J-Debit" in January 1999, which expanded nationwide in March 2000. Although its use is still limited compared to other instruments, the value of debit card transactions more than doubled from 2000 to JPY 305 billion (USD 2.5 billion) in 2001. At the beginning of October 2001, there were 1,765 financial institutions participating in J-Debit, and 1,173 merchants participating as direct participants. There were also 344 million cash cards that could be used as debit cards. As of January 2002, more than 180,000 terminals had been installed.

When a customer purchases goods or services using a debit card, the customer inserts the card into a CAT terminal and enters his/her personal identification number (PIN) from a keypad attached to the terminal. The transaction data are sent from the terminal to the customer's bank via the CAFIS Centre. Upon receiving the data, the bank debits the customer's account. The CAFIS Centre then sends the transaction data to the clearing centre, where net positions between banks are calculated on the day following the transaction. Interbank net positions are cleared again with other interbank payments through the Zengin System or through other smaller clearing systems operating within groups of financial institutions of the same type, two days after the transaction. The member merchant's account is credited three days after the transaction or later.

[17] Until 1983, banks were not allowed to issue credit cards themselves.

[18] Revolving credit facilities enable cardholders to make instalment payments.

2.9 Bills and cheques

Bills are used for payments in the business sector and can be discounted by banks. Cheques are widely used by government agencies and firms, but used only rarely for the payment of salaries or by individuals, eg for the payment of credit card bills and public utility bills. Both bills and cheques are collected and exchanged between banks at regional bill and cheque clearing houses (see Section 3.2). Recently, the volume of transactions using these paper-based instruments has been declining. The ratio of the value of bills and cheques cleared to nominal GDP declined from 8.6 times in 1991 to 1.7 times in 2001. This is because credit transfers have been used for payments by firms more widely than bills, for reasons such as the stamp tax on bills.

2.10 ATMs

Automated teller machines (ATMs) were first introduced by several city banks in 1969, and spread rapidly as many banks adopted online computer systems in the 1970s. ATMs were initially installed in bank lobbies, but began to appear at other easily accessible locations in 1973. ATMs provided cash withdrawal services only at the initial stage, but began to provide cash deposit services as well from 1977. Today they accept both banknotes and coins and process credit transfers and loans. Throughout the past couple of decades banks have installed increasing numbers of ATMs, with 116,905 machines deployed by the end of March 2002.

Since 1980, banks have linked their in-house ATM systems with other banks' systems to enable customers to withdraw banknotes from the ATMs of peer banks. To date, nine major online networks exist, each operated within a group of financial institutions of the same type.[19] The Multi Integrated Cash Service (MICS), established in 1990, serves as the relay centre for the nine networks, and provides nationwide ATM data transmission and clearing services. MICS had 1,916 financial institutions as members at the end of March 2002, linking virtually every financial institution in the private sector. The interbank credit and debit positions resulting from the use of these ATM networks are calculated at the end of each business day. Interbank net positions are cleared again together with other interbank payments through the Zengin System or the groups' own clearing systems, and then settled through the accounts held with the Bank of Japan or with the groups' central organisations.

Several banks plan to strengthen the security and increase the efficiency of their services by replacing traditional magnetic stripe cash cards with smartcards. Using a single multifunctional smartcard, customers will be able to access various types of services such as cash card, debit card, credit card and e-money services.

The Post Office and non-banks such as life insurance companies and securities companies also have their own ATMs. The number of ATMs installed by the Post Office totalled 25,802 at the end of March 2002.[20] Securities companies had installed 529 ATMs by the end of June 2002, and 10 major life insurance companies 640 ATMs by December 2001.

2.11 Firm banking

Firm banking (FB) is an online banking service for corporate customers available at their premises. Firms are able to obtain information, including their account balances and transaction records, and initiate credit transfers and direct debits by accessing their banks via telephone, facsimile, FB terminal or personal computer. With the widespread use of the internet, the use of personal computers as an access channel and the types of services offered through the internet have been increasing.

Firms using FB services are usually linked to their banks via the Automatic answer Network System for Electrical Request (ANSER) network or shared Cash Management Service (CMS) centres. ANSER is a data transfer system, provided by NTT Data Corporation since 1981, which links banks with firms.

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[19] City banks, regional banks, member banks of the Second Association of Regional Banks, trust banks, long-term credit banks and the Shoko Chukin Bank, *shinkin* banks, credit cooperatives, labour credit associations and agricultural cooperatives.

[20] The number of financial institutions that have connected their ATMs with the ATMs of the Post Office has been increasing rapidly since such connections were first established in 1999, and reached 2,084 in January 2002.

The shared CMS centres, the first of which began operation in 1987, connect firms with multiple banks in a single session. Shared CMS centres offer services such as multibank reporting (which enables firms to check their account balances at more than one bank simultaneously) and batch file transfer (which enables firms to send payment instructions including those related to payroll and direct debit to multiple banks at one time).

2.12 Home banking

Home banking allows individuals to access banking services online from home. It began with a telephone enquiry service and a pay-by-phone service in the early 1980s. An experiment for placing funds transfer orders by telephone using Nippon Telegraph and Telephone Corporation's Character and Pattern Telephone Access Information Network (CAPTAIN) system started in 1984. From that time until about 1997, various home banking services were offered using terminals such as TV game machines and touch-screen phones. Today, customers are able to access services including credit transfers and account balance enquiries by telephone, personal computer, mobile phone and digital TV.

Although the use of home banking was limited until around 1997, it has expanded rapidly since 1997 with the prevalence of personal computers and easy access to the internet.

2.12.1 Internet banking

Banks started providing internet-based banking services including credit transfers and account balance enquiries in 1997. The first internet-only bank, whose sole access channel is the internet (it has no physical branches) and which targets small business and individuals, appeared in 2000.

2.12.2 Mobile banking

Mobile banking is a type of internet banking using mobile phones as terminals. This became possible from 1999 as many mobile phones became equipped with text-based web interfaces. At the end of March 2002, and with the assistance of telecommunications companies, 334 financial institutions offered this type of service.

2.12.3 TV banking

With the launch of broadcasting satellite digital TV services in December 2000, several banks have started providing banking services via BS digital TVs. In one of the schemes, customers are able to view account and transaction information on their digital TV screens. They use remote control units to select services and enter information such as account numbers, PINs, names and transaction values. Transaction data are sent to the broadcasting company along telephone lines, and then to the bank via proprietary lines.

2.13 Convenience store banking

Convenience stores accept payments from customers settling their bills from public utilities and telecommunications companies, and send them to the receiving companies by credit transfer. This payment acceptance service started in 1987 and the use of this service has been increasing. Since 1999, convenience stores have installed ATMs at their premises that have access to the ATM services of various banks, including in some cases access to consumer finance services. In 2001, a bank that has no branches and relies heavily on convenience store ATMs started operation. The number of in-store ATMs stood at more than 10,000 as of March 2002.

Such services are becoming popular due to the fact that convenience stores are more easily accessible than banks in terms of both location and business hours. Convenience stores are found everywhere and open 24 hours a day, seven days a week, while bank windows are generally available only during bank business hours on weekdays.

3. Interbank payment systems

3.1 General overview

There are four major interbank payment systems in Japan: (1) bill and cheque clearing systems (BCCSs); (2) the Zengin Data Telecommunication System (Zengin System); (3) the Foreign Exchange Yen Clearing System (FXYCS); and (4) the BOJ-NET Funds Transfer System. The first three systems are privately owned clearing systems. Net settlement positions of participating financial institutions, which are calculated by these clearing systems, are settled through current accounts at the Bank of Japan.

In general, BCCSs and the Zengin System are used mainly for smaller-value transfers, and the FXYCS and the BOJ-NET Funds Transfer System for larger-value transfers. These four systems are regarded as systemically important payment systems (SIPS), considering the total amount processed. In 2001, the average value per transaction for bills and cheques cleared by the Tokyo Clearing House was JPY 9 million (USD 74,000), for the Zengin System JPY 2 million (USD 16,000), for the FXYCS JPY 720 million (USD 6 million) and for the BOJ-NET Funds Transfer System JPY 3.8 billion (USD 31 million).

3.2 Bill and cheque clearing systems

Bill and cheque clearing systems (BCCSs) provide clearing services mostly for bills and cheques, which are exchanged between financial institutions located within the same geographical area.

The first clearing house in Japan was set up in Osaka in 1879; the Tokyo Clearing House was established in 1887. As of December 2001, there were 540 bill and cheque clearing houses throughout Japan, of which 173 were designated by the Minister of Justice. According to the Bill Law and the Cheque Law, presentation of bills and cheques at designated clearing houses is deemed a means of presentation for payment.[21] More than 70% of the total value of bills and cheques exchanged in clearing houses throughout Japan is cleared by the Tokyo Clearing House, where a daily average value of JPY 2.6 trillion (USD 21.3 billion) was cleared in 2001.

3.2.1 Ownership

Major clearing houses are established and operated by their respective regional bankers' association. For example, the Tokyo Clearing House is operated by the Tokyo Bankers Association (TBA).

3.2.2 Participation

Large and medium-sized financial institutions, including banks and branches of foreign banks in Japan, participate in BCCSs directly. Small financial institutions participate in the systems indirectly through direct participants. As of December 2001, 421 institutions participated in the Tokyo Clearing House, of which 121 were direct participants.

3.2.3 Types of transaction

BCCSs mainly handle bills and cheques used for commercial transactions between firms. They also handle those used for financial transactions.

3.2.4 Operation of the system

Bills and cheques are cleared in the following manner: (1) bills and cheques are presented by payees at payees' banks; (2) these items are passed on to clearing houses; (3) the net positions of

[21] Presentation of bills and cheques at non-designated clearing houses (ie those not designated by the Minister of Justice) is also deemed a means of presentation for payment under agreements between the relevant parties.

participating banks are calculated at the clearing houses; and (4) payers' banks bring back bills and cheques from the clearing houses.

3.2.5 Settlement

The net positions of participants calculated by each clearing house are settled at the settlement bank designated by the clearing house.

In the case of 33 clearing houses, settlement of participants' net positions resulting from bill and cheque clearing takes place through the current accounts that their respective regional bankers' association holds with the Bank of Japan. Funds are first transferred from the accounts of participants with net debit positions to the account of the regional bankers' association and, after completion of such transfers, the funds are then transferred from the account of the regional bankers' association to the accounts of participants with net credit positions. This process is performed through the BOJ-NET Funds Transfer System on an RTGS basis at 12:30. Interbank settlement is final once the net positions of participants are settled through the BOJ-NET Funds Transfer System. In general, however, the payee cannot withdraw funds until 13:00 on the business day following interbank settlement, because dishonoured bills or cheques may be returned from the payer's bank to the payee's bank until 11:00 on that day.

3.2.6 Risk management

There is no limit placed upon the size of the settlement obligation arising from bill and cheque clearing to which a participant may become liable. Should a participant fail to settle its net obligation, the clearing house is expected to promptly exclude the transactions involving the defaulting participant and then to recalculate the net positions of the remaining participants.

3.2.7 Technical aspects

The Tokyo Clearing House began automation of the clearing process in 1971 with the incorporation of computers and facilities that read and sort bills and cheques. All processing of "magnetic ink character recognition"-printed (MICR-printed) bills and cheques presented at banks has since been automated, including sorting these items according to the payer's bank and calculating receipts, payments and the net position of each bank. Meanwhile, most clearing houses process bills and cheques manually.

3.2.8 Pricing policies

In the case of the Tokyo Clearing House, a participant that is not a member of the TBA pays an admission fee to become a participant in the Tokyo Clearing House. Direct participants bear the operational cost of the Tokyo Clearing House in proportion to the volume of their transactions during the previous year.

3.2.9 Governance

Although each clearing house sets its own rules, clearing houses have been encouraged to harmonise their rules to enhance the efficiency of financial institutions' cash management. For example, the standard settlement time of 12:30 has been adopted. Any revision to the rules of the clearing houses that use the central bank accounts for settlement requires the approval of the Bank of Japan.

3.3 Zengin Data Telecommunication System

The Zengin Data Telecommunication System (Zengin System), an interbank clearing system for domestic funds transfers, started operation in 1973. In 2001, the system handled a daily average volume of 5 million transactions, while the daily clearing value averaged JPY 10 trillion (USD 82 billion).

Small financial institutions, ie *shinkin* banks, credit cooperatives, labour credit associations, agricultural cooperatives and a group of regional banks, have their own interbank clearing systems. The structure of each of these systems is similar to that of the Zengin System.

3.3.1 Ownership

The Zengin System is operated by the TBA.

3.3.2 Participation

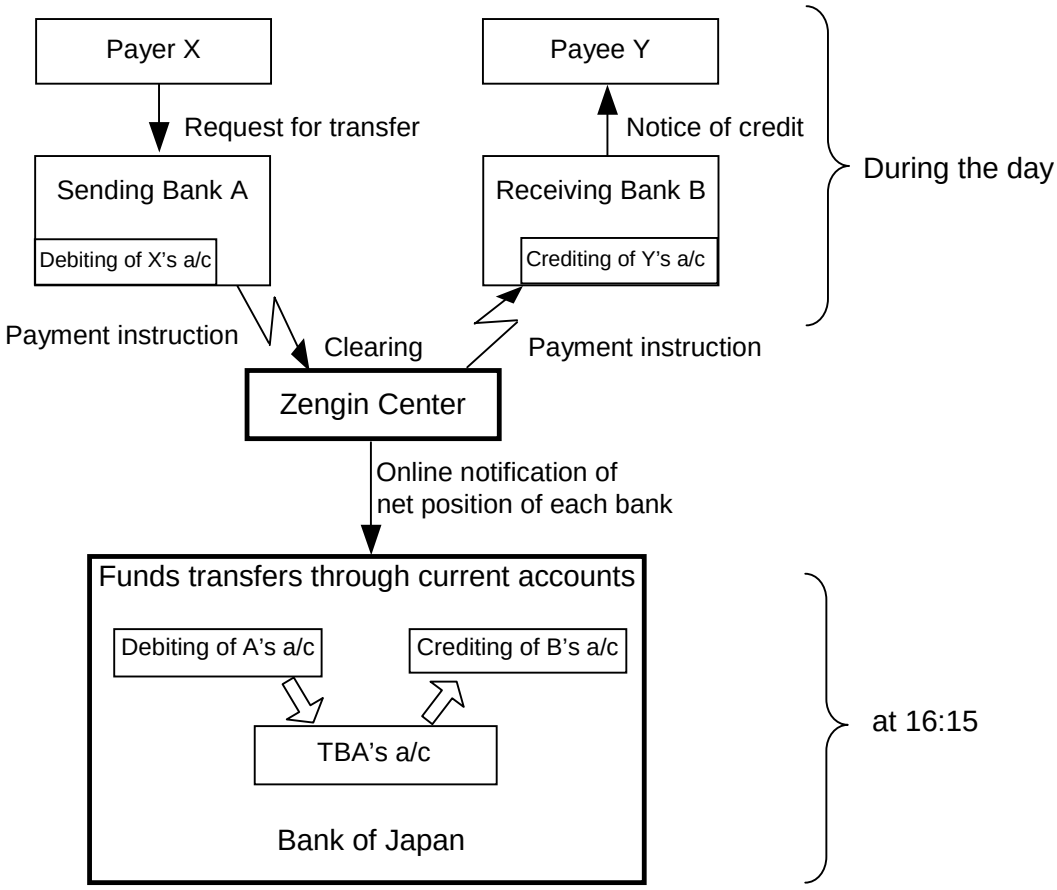
Financial institutions such as banks and branches of foreign banks in Japan participate directly in the Zengin System. Small financial institutions participate in the system through their respective clearing systems, which are linked with the Zengin System. As of December 2001, 2,021 institutions were participating in the system, of which 154 were direct participants. End users include firms and individuals. The Zengin System is not linked with the postal funds transfer system.

3.3.3 Types of transaction

The Zengin System clears domestic funds transfers for third parties, where not only sending banks and receiving banks but also payer customers and/or payee customers are involved. Transactions of this type include remittances, direct credits such as the payment of salaries and pensions, and payments resulting from the inter-regional collection of bills and cheques.

Chart 1

Zengin Data Telecommunication System



3.3.4 Operation of the system

Payments are processed through the Zengin System in the following manner (see Chart 1 above):

(1) The payer requests the sending bank to make a funds transfer.

(2) The sending bank accordingly sends a payment instruction to the Zengin Centre, which, in turn, sends the instruction to the receiving bank between 08:30 and 15:30. At the same time,

and on a transaction by transaction basis, the obligation between the sending bank and the receiving bank is replaced with two obligations: one between the sending bank and the TBA; the other between the receiving bank and the TBA.

(3) Upon receiving the instruction, the receiving bank credits the payee's account.

(4) Net debit or credit positions between each bank and the TBA are calculated within the system.

(5) The Zengin Centre sends information on the net positions to the Bank of Japan using the Zengin System network.

3.3.5 Settlement

The net positions of participants of the Zengin System are settled through the BOJ-NET Funds Transfer System on an RTGS basis at 16:15.[22] Funds are first transferred from the accounts of participants with net debit positions to the account of the TBA and, after completion of such transfers, the funds are then transferred from the account of the TBA to the accounts of participants with net credit positions.

Interbank settlement is final once the net positions of participants are settled through the BOJ-NET Funds Transfer System. Funds may, in many cases, become available to payees before interbank settlement takes place, because a receiving bank usually credits a payee's account upon receipt of a payment instruction from the Zengin Centre.

3.3.6 Risk management

In January 2001, the Zengin System introduced a set of new risk management measures to accommodate the Bank of Japan's introduction of a new RTGS system. Under the new scheme, the TBA acts as the central counterparty (CCP), and the obligations between participants are replaced with those between participants and the TBA.

Each participant is required to deposit collateral with the TBA equivalent to its sender net debit cap. Each participant can substitute all or part of the collateral with guarantees from other participants ("guarantor banks"). Guarantor banks need to deposit collateral with the TBA to cover the two largest guarantees they give.

Should a participant fail to settle its net obligation, the TBA will obtain necessary liquidity from banks assigned in advance as "liquidity provider banks", and complete settlement. Under this scheme, the 25 banks designated as liquidity provider banks would be able to cover a default by the two participants with the largest sender net debit cap. In order to repay liquidity provider banks the funds provided in an emergency, the TBA can sell in the market the collateral deposited by the defaulting participant. When the defaulting participant's collateral is substituted by guarantees, the guarantor banks for that participant will provide funds to repay liquidity provider banks.

3.3.7 Technical aspects

Participants in the Zengin System exchange payment instructions electronically via relay computers (RCs), which are installed either by participants or by joint centres for certain groups of financial institutions including various cooperatives. The Zengin Centre and the Bank of Japan are linked through the network of the Zengin System.

The computer facility of the Zengin System has been updated to meet the need for increased capacity. The current computer facility, in use since 1995, is the fourth generation. A fifth-generation computer facility is scheduled to start operation in November 2003. For operational resiliency, two sets of main computer systems have been operating separately in both Tokyo and Osaka since 1987, and they function as mutual backup facilities.

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[22] Due to the heavy traffic of instructions flowing through the Zengin System, on the last business day of each month settlement takes place at 17:15 with an hour longer window for instruction exchanges, and on the last business day of the year at 16:45 with a half-hour longer window for instruction exchanges.

3.3.8 Pricing policies

Each participant pays an admission fee to the TBA upon joining the Zengin System. The operational costs of the Zengin Centre, communication costs and 20% of the operational costs of each relay computer (RC) are borne by participants in proportion to the volume and value of their respective transactions. The remaining 80% of RC costs are borne by each participant using its RCs.

3.3.9 Governance

The Organization for the Management of Domestic Fund Transfers, established by the TBA, sets rules that govern the clearing procedures of the Zengin System. The Organization is required to consult with the Bank of Japan if any revisions are needed to the rules relating to settlement or membership criteria of the Zengin System.

3.4 Foreign Exchange Yen Clearing System

The Foreign Exchange Yen Clearing System (FXYCS) was established in 1980 to facilitate the clearing of yen payments for cross-border financial transactions. Originally, the system operated on a paper basis. To cope with the rapid growth of transaction volume, the TBA automated the system and consigned operation to the Bank of Japan in 1989. Clearing has since been conducted through the BOJ-NET. In 2001, the system handled a daily average volume of 39,000 transactions, while the daily clearing value averaged JPY 28 trillion (USD 230 billion).

3.4.1 Ownership

The FXYCS is owned by the TBA. The automated system is a part of the BOJ-NET.

3.4.2 Participation

At the end of 2001, 244 financial institutions, including 73 branches of foreign banks in Japan, participated in the FXYCS. Of these, 40 were direct participants which access the BOJ-NET directly, and the other 204 were indirect participants which participate in the system through direct participants.

3.4.3 Types of transaction

The FXYCS handles yen payments resulting from cross-border financial transactions including foreign exchange transactions, yen-denominated bond transactions and export-import payments.

3.4.4 Operation of the system

The following shows how payments are processed through the FXYCS (see Chart 2):

(1) The payer in a foreign country instructs the payer's bank to make a yen payment to the payee in Japan.

(2) The payer's bank requests a funds transfer, using SWIFT or telex, to its correspondent bank (sending bank) in Japan.

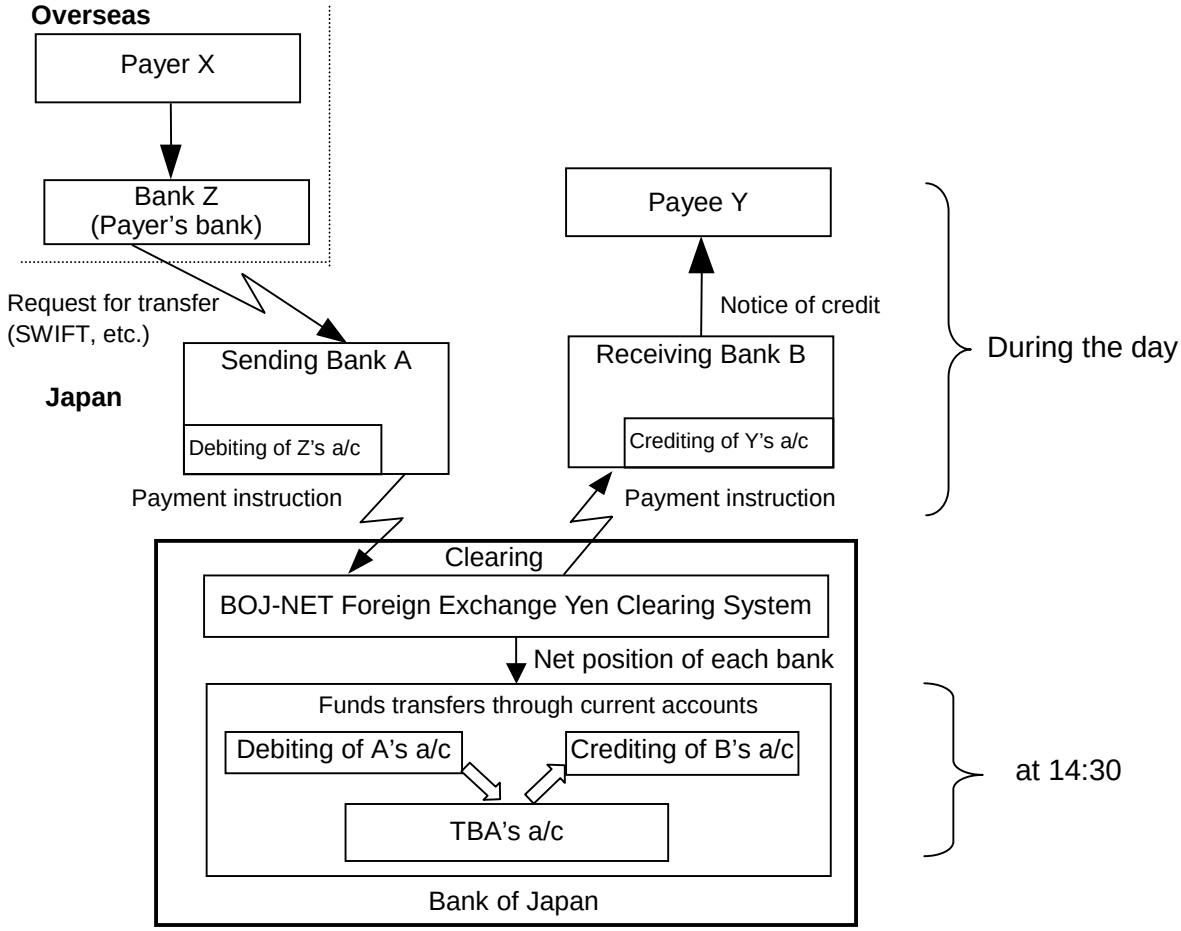
(3) The sending bank sends a payment instruction to the BOJ-NET, which, in turn, sends the instruction to the receiving bank between 09:00 and 13:45. At the same time, and on a transaction by transaction basis, the obligation between the sending bank and the receiving bank is replaced with two obligations: one between the sending bank and the TBA; the other between the receiving bank and the TBA.

(4) Upon receiving the instruction, the receiving bank credits the account of the payee.

(5) On behalf of the TBA, the Bank of Japan calculates the daily net positions between each bank and the TBA using the BOJ-NET.

Chart 2

Foreign Exchange Yen Clearing System



3.4.5 Settlement

The net positions of participants of the FXYCS are settled through the BOJ-NET Funds Transfer System on an RTGS basis at 14:30. Funds are first transferred from the accounts of the participants with net debit positions to the account of the TBA and, after completion of such transfers, the funds are then transferred from the account of the TBA to the accounts of the participants with net credit positions.

Interbank settlement is final once the net positions are settled through the BOJ-NET Funds Transfer System. Funds may, in many cases, become available to payees before interbank settlement takes place, because a receiving bank usually credits a payee's account upon receipt of a payment instruction from the BOJ-NET.

RTGS mode is also available for participants' individual payments, although use of this mode is rather limited. All participants can use RTGS mode from 09:00 to 17:00 every business day, while the participants which made an advance application can use it until 19:00. In this mode, instructions sent to the Bank of Japan are processed on an individual basis immediately upon receipt, for settlement through current accounts held with the Bank.

3.4.6 Risk management

In December 1998, a set of new risk management measures was introduced to the FXYCS. Under the new scheme, the TBA acts as the CCP, and the obligations among participants are replaced with those between participants and the TBA. Each participant is required to set a net credit limit (NCL)

against every other participant on a bilateral basis. The sender net debit cap, placed to limit the total net amount of payments made by a participant, is 4.73% of the total amount of NCLs that the other participants set against that participant.

Should a participant fail to settle its net obligation, the FXYCS loss-sharing rule requires the remaining banks ("survivor banks") to bear the net obligation of the defaulting participant in order to cover the shortfall in funds for the settlement. That is, the survivor banks must provide the TBA with funds allocated in proportion to their share of the NCLs set for the defaulting participant. In order to be prepared for such a contingency, each participant is required to deposit collateral with the TBA in advance. The amount of collateral required for each participant is set at the larger of (1) 5.1% of the largest NCL each participant has set against the other participants, or (2) JPY 100 million (USD 822,000).

Should a survivor bank be unable to provide the allocated amount in a timely manner, it may ask the TBA for a postponement. The TBA will then obtain the necessary liquidity from banks assigned in advance as "liquidity provider banks", and complete settlement. The 10 banks designated as liquidity provider banks would be able to cover a default by the participant with the largest sender net debit cap. Should a survivor bank that has postponed its provision of funds fail to provide these to the TBA by 14:00 of the next business day following the default, the TBA can, if necessary, sell in the market the collateral deposited by the survivor bank and repay the liquidity provider banks.

3.4.7 Technical aspects

The whole clearing process is performed electronically via the BOJ-NET Foreign Exchange Yen Clearing System, which is a part of the BOJ-NET. Direct participants of the FXYCS access the system through BOJ-NET terminals installed on their premises. Direct connection between participants' host computers and the host computer of the BOJ-NET (computer-to-computer connection) is also available.

3.4.8 Pricing policies

Financial institutions other than members of the Japanese Bankers Association pay admission fees to the TBA. Regarding annual operational costs, direct participants bear a large part, of which 20% is borne equally among them and 80% in proportion to the value of their transactions the previous year. Indirect participants bear the remaining part of the costs equally. In addition to the above costs, each direct participant pays JPY 60 (USD 0.5) per transaction as a transaction fee for using the BOJ-NET.

3.4.9 Governance

The TBA lays down rules for the FXYCS that stipulate membership criteria, procedures for entry to and withdrawal from the FXYCS and clearing procedures. Any revision to the rules requires the Bank of Japan's approval.

3.5 BOJ-NET Funds Transfer System

The BOJ-NET Funds Transfer System is an online electronic funds transfer system introduced in 1988. The BOJ-NET comprises two systems: a system for funds transfers (BOJ-NET Funds Transfer System) and a system for the settlement of JGBs (BOJ-NET JGB Services). Although the BOJ-NET Funds Transfer System originally offered both designated-time settlement mode and RTGS mode for the settlement of funds, the Bank of Japan abolished designated-time settlement and made RTGS the only available settlement mode at the beginning of 2001. The daily volume and value of transactions settled through the BOJ-NET Funds Transfer System averaged 21,000 transactions and JPY 77 trillion (USD 634 billion) in 2001.

3.5.1 Ownership

The BOJ-NET Funds Transfer System is owned and operated by the Bank of Japan.

3.5.2 Participation

At the end of 2001, there were 383 participants in the BOJ-NET Funds Transfer System, including 162 banks, 72 branches of foreign banks in Japan, 83 *shinkin* banks, five central organisations of cooperatives, 46 securities companies, three money market brokers and other institutions such as stock exchanges. Sufficient operational reliability is required for the Bank of Japan's current account holders to participate in the system.

3.5.3 Types of transaction

The BOJ-NET Funds Transfer System offers most of the payment services provided by the Bank of Japan, which are: (1) funds transfers between financial institutions stemming from interbank money market and securities transactions; (2) funds transfers between different accounts of the same financial institution;[23] (3) settlement of net positions arising from privately owned clearing systems; and (4) funds transfers between financial institutions and the Bank of Japan, including those for open market operations. Most funds transfers made through the BOJ-NET Funds Transfer System are credit transfers, but in the case of in-house funds transfers, debit transfers can also be made. A sending bank can transmit a payment instruction with information regarding its and/or the receiving bank's customers.

3.5.4 Operation of the system

Almost all interbank transactions settled through the current accounts held with the Bank of Japan are processed on an RTGS basis.[24] Operating hours of the BOJ-NET Funds Transfer System are from 09:00 to 17:00 for all participants and from 09:00 to 19:00 for those which made an advance application every business day. Net positions stemming from privately owned clearing systems are settled on an RTGS basis at the following times: 12:00 for TIFFE; 12:30 for BCCSs; 14:30 for the FXYCS; and 16:15 for the Zengin System.

Part of BOJ-NET participants' payments to and receipts from the Bank of Japan are netted out on a bilateral basis between participants and the Bank, and the resulting net settlement positions of participants are credited to or debited from their current accounts with the Bank simultaneously and independently at designated times. This settlement mode, called "simultaneous processing", takes place at 09:00, 13:00, 15:00 and 17:00.[25]

3.5.5 Settlement

Settlement is final once effected through the BOJ-NET Funds Transfer System.

The Bank of Japan started providing an intraday overdraft facility in January 2001 in order to facilitate smooth settlement on an RTGS basis. Intraday overdrafts are available to all current account holders without charge if repaid by the end of the day. Intraday overdrafts are also available as part of a scheme for the simultaneous processing of DVP and collateralisation (SPDC) (see Section 4.2.2.2).

3.5.6 Risk management

To reduce systemic and other risks inherent in designated-time settlement, the Bank of Japan abolished designated-time settlement in January 2001 and made RTGS the only available settlement mode for funds transfers through its current accounts. The intraday overdraft is fully collateralised with eligible assets pledged with the Bank. Collateral is weekly marked to market with haircuts, which vary

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[23] Financial institutions are able to hold current accounts with different offices (head office and regional branches) of the Bank of Japan.

[24] The only exception is payments for DVP settlement of corporate and other bond transactions, which are settled simultaneously at 15:00.

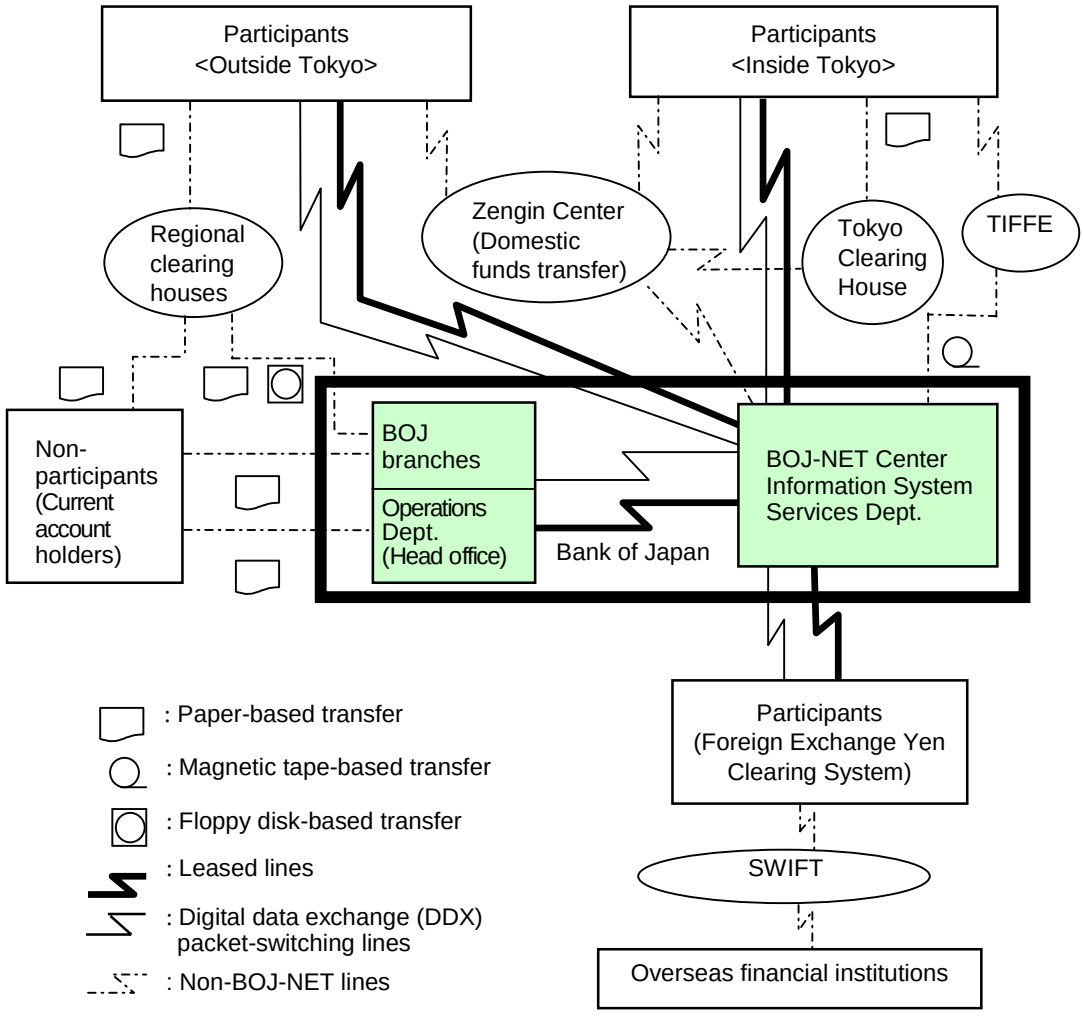
[25] On days when settlement for the Zengin System takes place at 16:45 or 17:15, the closing time of the BOJ-NET Funds Transfer System is extended to 17:30 or 18:00 respectively for all participants, and the end-of-day simultaneous processing, which usually takes place at 17:00, takes place at 17:30 or 18:00.

according to the type of security and residual maturity. No quantitative limit is currently imposed on the amount of intraday overdraft.

Contingency measures are in place to cope with hardware and software malfunctions. The host computer systems at the BOJ-NET Centre are duplicated to ensure safety. Both systems, system A and system B, use identical equipment, and each system comprises an active machine and a hot standby machine. In other words, four host computers are always ready for operation. Most peripheral equipment, such as the communication control unit and database, is also duplicated. A backup centre for the BOJ-NET has also been set up in Osaka. Operation of the BOJ-NET is constantly monitored at the computer centre to detect problems at the earliest possible stage. The Bank also uses passwords, ID cards and data encryption to ensure security of the information passed over the network.

Chart 3

Bank of Japan Financial Network System



3.5.7 Technical aspects

The Bank of Japan offers BOJ-NET participants several ways to access the BOJ-NET, and participants can choose the way that best suits their operations. The majority of participants access the BOJ-NET through dedicated BOJ-NET terminals. In order to streamline participants' operations

with respect to a large volume of transactions, in addition to the NTC[26] file transfer function and floppy disk data exchange function using BOJ-NET terminals, computer-to-computer connections are also available. Most major financial institutions use computer-to-computer connections for their operations.

The system network is based on leased lines and "digital data exchange" (DDX) packet-switching lines, which are provided by the NTT Group, a Japanese common carrier. These two types of line are connected with host computers at the BOJ-NET Centre; leased lines are used for computer-to-computer connections, while DDX packet-switching lines are used for linkages with BOJ-NET terminals. To ensure continuity of service, lines connecting the BOJ-NET Centre and participants for computer-to-computer connections are duplicated. Lines connecting the BOJ-NET Centre and telephone exchanges for linkages with BOJ-NET terminals are also duplicated (see Chart 3 above for the structure of the BOJ-NET).

In January 2002, the Bank released for public comment a proposal for further improving the network infrastructure of the BOJ-NET, to accommodate innovations in network technology and the standardisation of message formats. Specific plans include: (1) improving computer-to-computer connections (eg adoption of TCP/IP); (2) enabling PC-based connection; and (3) ensuring flexibility with regard to message format by adjusting the system to accept formats based on the international standard. Following public consultation, the Bank decided in March 2002 to implement its proposal.

3.5.8 Pricing policies

Regarding costs for the BOJ-NET, the costs of linkage with the BOJ-NET and for using its circuits are borne by participants, which benefit from online processing through the BOJ-NET. On the other hand, the Bank of Japan bears other costs such as the purchasing/leasing costs of computers and programming costs, which improve the Bank's operational infrastructure.

The cost of using the BOJ-NET incurred by participants in the system comprises two parts: monthly-fixed charge and transaction fees. Participants pay a fixed charge for linkage with the BOJ-NET: JPY 5,000-10,000 (USD 40-80) per line for connection via terminals and JPY 800,000 (USD 6,600) per line for computer-to-computer connection. Transaction fees for the BOJ-NET Funds Transfer System are JPY 40 (USD 0.3) for ordinary funds transfers and JPY 60 (USD 0.5) for third-party funds transfers.

3.5.9 Governance

The Bank of Japan reviews the design and operation of the BOJ-NET on the basis of international standards such as the Core Principles for Systemically Important Payment Systems drafted by the Committee on Payment and Settlement Systems (CPSS) of the central banks of the Group of Ten countries. Based on these review findings, the Bank of Japan then develops an improvement plan for the BOJ-NET and implements it following approval by the Policy Board, the governing body of the Bank. The Bank of Japan makes the plan public and seeks comment from system participants where necessary. The Operations Department and the Information System Services Department are in charge of the BOJ-NET operations. The Bank's Executive Auditors and the Internal Auditors' Office audit and examine the Bank's operations, including issues relevant to the BOJ-NET.

4. Securities settlement systems

4.1 General overview

There are central securities depositories (CSDs) for Japanese government bonds (JGBs) and stocks (these are the Bank of Japan and the Japan Securities Depository Centre (JASDEC) respectively), but not for other types of bonds or commercial paper (CP). JGB transactions are settled on a real-time delivery versus payment (DVP) basis through the BOJ-NET JGB Services, an online system for

[26] *Nichigin* Terminal Control equipment.

transferring JGBs between financial institutions. Transactions in stocks deposited at JASDEC are settled by book entries, and DVP is available for stocks traded on the exchanges. Corporate and other bonds such as government-guaranteed bonds and municipal bonds are registered and transferred on the books of a number of registrars. An online network system called JB Net links participants (investors and dealers), registrars and the Bank of Japan, and enables settlement of these registered bond transactions to be processed on a DVP basis. Although there has not been a CSD for CP, a book-entry system developed by JASDEC is expected to start settlement of CP transactions on a real-time DVP basis from March 2003 under the new legal framework.

Settlement cycles vary depending on the type of security. T+3 rolling settlement is the norm for corporate bonds, municipal bonds, stocks and JGBs, although settlement of JGBs for open market operations takes place T+0, T+1, T+2 and T+3.[27] The settlement cycle for CP is T+1 or T+2.

4.2 Japanese government bonds and bills

4.2.1 Trading

The outstanding balance of securities issued by the Japanese government was JPY 461 trillion (USD 3.5 trillion) at the end of 2001, which comprised JPY 387 trillion (USD 2.9 trillion) in JGBs, JPY 31 trillion (USD 236 billion) in treasury bills (TBs) and JPY 43 trillion (USD 327 billion) in financing bills (FBs). The value of JGB transactions in the over-the-counter (OTC) market reached JPY 3,863 trillion (USD 31.8 trillion) during 2001, accounting for 95% of cash bond transactions.[28] The volume of JGB transactions effected through a variety of screen-trading systems began to grow from mid-2000.

Repo transactions[29] are actively made between various entities including securities companies, banks, insurance companies, investment trusts and other corporations. Prior to April 2001, there were two types of repo transactions in the Japanese repo market, namely *gensaki* (buy/sellback transactions which did not incorporate risk management measures such as margining and closeout netting) and cash-collateralised bond lending.

The JGB lending market has grown tremendously since the abolition of restrictions on cash-collateralised bond lending in 1996, and cash-collateralised bond lending is currently the predominant transaction in the repo market. At the end of 2001, the outstanding amount of bond lending transactions totalled JPY 46.4 trillion (USD 353 billion), of which the bulk - JPY 40.2 trillion (USD 306 billion) - consisted of cash-collateralised bond lending.

In addition to the two types of repo transactions above, a new type of repo transaction (repurchase agreement), which is almost the same as repos in the US and European markets, was introduced to replace *gensaki* in April 2001. After the introduction of repurchase agreements, *gensaki* transactions were abolished in March 2002.

4.2.2 Clearing and settlement

There is no major trade confirmation system or clearing system for JGB transactions in the OTC market. However, there are plans to extend the confirmation services offered in the pre-settlement matching system operated by JASDEC to include JGB transactions. Also, market participants and relevant parties have been conducting a feasibility study for the introduction of a CCP mechanism in OTC JGB transactions.

There are two arrangements for the settlement of JGBs without physical delivery: the JGB Registration System and the JGB Book-entry System. Physical delivery of certificates is also possible, but rarely occurs.

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[27] JGB transactions include those involving both treasury bills (TBs) and financing bills (FBs).

[28] Total of purchases and sales including *gensaki* transactions.

[29] Transactions that involve the exchange of securities for funds for a certain period.

The JGB Registration System was introduced in 1906 with the Bank of Japan as the registrar, based on the Law Concerning Government Bonds. In this system, registrations are made on the book kept at the registrar, so that JGBs are transferred without physical delivery. Participants are not limited to financial institutions; any JGB holder can use the system. In recent years, participants have been shifting their holdings of JGBs from the JGB Registration System to the JGB Book-entry System, due largely to the relevant tax reforms.[30]

The JGB Book-entry System was introduced in 1980 in response to the rapid growth of the volume of JGB transactions and their settlement. It is a tiered system, consisting of direct participants, indirect participants, foreign indirect participants, customers and the depository, namely the Bank of Japan. There are requirements set by the Bank of Japan for participation in the JGB Book-entry System (see Section 1.2.2). Direct participants, indirect participants and foreign indirect participants include financial institutions such as banks and securities companies. The deposit rate[31] in the JGB Book-entry System was 99% at the end of 2001.

The daily average volume and value of transactions settled during 2001 were 11,500 transactions and JPY 42 trillion (USD 346 billion) for the JGB Book-entry System, and 94 transactions and JPY 60 billion (USD 494 million) for the JGB Registration System.

JGB transfers under the JGB Registration System and the JGB Book-entry System are processed through the BOJ-NET JGB Services, an online system for the transfer of JGBs, owned and operated by the Bank of Japan. The BOJ-NET JGB Services began operation in 1990, and the DVP mechanism was introduced in 1994 by connecting the BOJ-NET JGB Services with the BOJ-NET Funds Transfer System.

Participants in the JGB Registration System or the JGB Book-entry System can give instructions regarding JGB delivery to the Bank of Japan, either in paper form or online through the BOJ-NET JGB Services. At the end of 2001, the number of users of the BOJ-NET JGB Services was 360 for the JGB Book-entry System and 398 for the JGB Registration System. Operating hours of the BOJ-NET JGB Services are from 09:00 to 16:30.

Since 1997, settlement of JGB transactions has been taking place on a T+3 basis.[32] Before rolling settlement was introduced in 1996, JGBs were settled in principle on the 5th, 10th, 15th, 20th, 25th and the last business day of every month as a market practice in which the average period between trade and settlement was around seven days.

4.2.2.1 Changeover to the RTGS system

The Bank of Japan provided two different modes for settlement of JGBs - real-time gross settlement (RTGS) and designated-time settlement - until January 2001, when it abolished designated-time settlement and made RTGS the only available mode for settlement. After the changeover, settlement through the BOJ-NET JGB Services took place on an RTGS basis with the following three exceptions, which were settled simultaneously at 15:00: (1) transactions involving JGBs kept in custody with the Bank of Japan by foreign central banks and international organisations; (2) JGB issuance for which payments are made online; and (3) JGB transactions involving the Bank of Japan or the government as the buyer or borrower, and outright purchases/sales of TBs/FBs in the Bank's open market operations. In April 2001, however, the Bank of Japan published its Schedule for Additional Measures Relating to Real-Time Gross Settlement of Japanese Government Securities Transactions, in which it laid out a schedule for switching to RTGS for these types of transactions. Switching has been proceeding according to this schedule (for example, JGB issuance for which payments are made

[30] The exemption from withholding tax on interest payments on JGBs is granted only to book-entry JGBs held by designated financial institutions, and by non-residents of Japan and foreign corporations.

[31] The ratio of the outstanding amount of book-entry JGBs, TBs and FBs to the total outstanding amount of JGBs, TBs and FBs. That of registered JGBs was 0.7%. Both TBs and FBs can only be held in the JGB Book-entry System.

[32] T+3 is the norm for outright transactions. Most repo transactions are settled on a T+2 or T+3 basis.

online (ie (2) above) has been processed on an RTGS basis since June 2002), and so far the majority of these exceptions have been removed.[33]

4.2.2.2 Liquidity-saving facility

To facilitate smooth settlement of a large volume of JGB transactions on a real-time DVP basis, the Bank of Japan started providing a liquidity-saving facility, or simultaneous processing of DVP and collateralisation (SPDC), with the changeover to the RTGS system in January 2001.

Using SPDC, a participant in the BOJ-NET JGB Services may post the securities traded in DVP transactions as collateral to the Bank of Japan to obtain an intraday overdraft needed for payments for the transactions concerned. For example, in the case of JGB purchases, a buying participant is able to do the following at the same time: (1) receive JGBs from a seller; (2) pledge these JGBs to the Bank as collateral for an intraday overdraft; (3) draw the intraday overdraft from the Bank; and (4) pay for the JGBs received from the seller with the intraday overdraft. A selling participant is able to do the following at the same time: (1) receive the pledged JGBs from the Bank; (2) deliver these JGBs to a buyer; (3) receive from the buyer the proceeds from the JGBs sold; and (4) repay the intraday overdraft to the Bank with the proceeds received in (3). These two sets of processes take place at the same time when both the buyer and the seller of the JGBs use SPDC.[34]

To use SPDC, a participant in the BOJ-NET Funds Transfer System must open a special current account at the Bank of Japan, separate from its ordinary current account. A participant may transfer funds between the ordinary current account and the special current account for SPDC. The use of special current accounts is limited to the operating hours of the BOJ-NET JGB Services, which are shorter than those of the BOJ-NET Funds Transfer System (see Section 3.5.4). Participants are required to return the balance of their special current accounts to zero prior to the BOJ-NET JGB Services' closing time.

4.2.2.3 Conversion to the New JGB Book-entry System

From 27 January 2003, the JGB Book-entry System is scheduled to begin operations under the Transfer of Corporate Debt Securities Law enacted in June 2002, although this is subject to the fulfilment of certain conditions, such as the Bank's designation as an eligible operator ("transfer institution") by the competent ministers. Under the new system, JGBs, TBs and FBs will be fully dematerialised (rather than immobilised as in the existing system), and transfer of these securities will be effected by book entries based on the new law, while the basic mechanism of settlement will not change. The conversion to the new system will achieve greater efficiency of safekeeping and settlement of JGBs, TBs and FBs. It will also make the legal structure of book-entry transfers easier to understand than under the existing system, in which book-entry transfers are governed by contracts between the Bank and system participants under general private laws.

4.3 Corporate and other bonds

4.3.1 Trading

Corporate and other bonds (ie non-JGB bonds), such as government-guaranteed bonds, municipal bonds, bank debentures and yen-denominated foreign bonds, are mainly traded in the OTC market, as is the case for JGBs. The outstanding amount of corporate and other bonds was JPY 191 trillion (USD 1.5 trillion) at the end of 2001, and the total trading value of OTC corporate and other bonds during 2001 was JPY 188 trillion (USD 1.5 trillion).[35]

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[33] The remaining transactions, which will also switch to RTGS within a few years, include delivery of book-entry JGBs to foreign central banks and international organisations as well as outright purchases/sales of TBs/FBs in the Bank's open market operations.

[34] For more details, see Bank of Japan, *Framework for restructuring BOJ-NET JGB Services*, September 1998 (available on the Bank's website).

[35] The total value of purchases and sales of corporate bonds, government-guaranteed bonds, municipal bonds, bank debentures and yen-denominated foreign bonds.

4.3.2 Clearing and settlement

Under the Law on Registration of Corporate and Other Bonds, almost 80%[36] of the outstanding amount of corporate and other bonds is held in the form of registered bonds at registrars. The registrars differ from issue to issue, and about 160 banks currently act as registrars. Physical certificates of corporate and other bonds are brought to the registrars and registered in non-paper form. The serial numbers assigned to every physical certificate are recorded on the registration books of the registrars, and registered corporate and other bonds are managed and handled according to these numbers. Delivery of registered corporate and other bonds is processed by changing the holders' names on the registration books kept by the registrars (transfer registration) in accordance with the requests of both sellers and buyers.

The Japan Bond Settlement Network Co, Ltd (JB Net) operates an online network system that links participants (investors and dealers), registrars and the Bank of Japan. DVP is achieved using the network in the following way: (1) when a seller agrees to sell a bond to a buyer, the buyer produces a "message authentication code" (MAC)[37] and transmits it to the seller; (2) the seller submits a delivery instruction with the buyer's MAC to JB Net; (3) JB Net checks the data in the instruction and transmits the necessary information to the registrar;[38] (4) in addition to dealing with the delivery instruction, JB Net produces separate data on the cash leg of the settlement and sends them to the BOJ-NET; (5) based on this information, the Bank advises the buyer or seller of the net amount to be credited to or debited from their current accounts at the Bank; (6) the buyer notifies the Bank of its acceptance of payment, and settlement of the cash leg takes place at 15:00[39] on the settlement day; and (7) when the settlement of the cash leg is completed, the Bank transmits the settlement result to JB Net, which transmits the result to the registrar, who makes transfer registration of the corresponding security. In 2001, the daily average volume and value of transactions processed through JB Net were 574 transactions and JPY 276 billion (USD 2.3 billion) respectively.

JASDEC and market participants are planning to introduce a book-entry system for corporate and other bonds under the Transfer of Corporate Debt Securities Law.

Corporate and other bond transactions have been settled on a T+3 basis since 1999. Before rolling settlement was introduced for corporate and other bonds in 1997, they had been settled on the 10th, 20th and the last business days of every month.

4.4 Commercial paper

4.4.1 Trading

The commercial paper (CP) market has grown significantly since its inception in 1987. The deregulation that took place in 1998, enabling CP issuance by banks and direct issuance of CP by corporations to end-investors (known as direct issuance), contributed significantly to this growth. The outstanding amount of CP was JPY 16.5 trillion (USD 126 billion) at the end of 2001. Financial institutions such as banks, securities companies and money market brokers actively engage in repo transactions of CP, accounting for almost all the transactions in the secondary market.

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[36] This refers to the ratio of the outstanding balance of registered corporate and other bonds (or corporate and other bonds that are held in non-paper form) to the outstanding balance of corporate and other bonds, which was 79% at the end of March 1997.

[37] MAC is a numerical code, used instead of a signature or seal, to confirm the intent of the counterparty who does not provide online instructions for the transaction. It is calculated, using a special encryption method, from (1) an encryption key provided to each participant, and (2) the content of a given transaction request (details of the seller, buyer, issue, value, etc) represented in the form of a numerical value.

[38] JB Net transmits information about each delivery instruction to registrars via pre-settlement service institutions. The institutions examine the content of instructions, assign a bond serial number if necessary, rearrange the order of instructions, check the balance of the sellers' accounts and submit the delivery instructions to the registrars on the settlement day.

[39] All payments for DVP settlement of corporate and other bond transactions are settled simultaneously at 15:00 through the BOJ-NET Funds Transfer System.

4.4.2 Settlement

There is no CSD for CP. CP is usually issued without a named payee (known as blank bills) and is traded in the secondary market. In repo transactions, delivery of CP is normally effected by means of deposit receipts prepared by the seller, and CP certificates are physically held at dealers until redemption. Settlement of most CP transactions currently takes place on a T+1 or T+2 basis.

Dematerialised CP is expected to be issued and settled on a real-time DVP basis from March 2003, using a book-entry system that is being developed by JASDEC, under the Transfer of Corporate Debt Securities Law.

4.5 Stocks and convertible bonds

4.5.1 Trading

While there are five stock exchanges in Japan, the Tokyo Stock Exchange handles most of the transactions in listed stocks. In 2001, total trading value on the exchanges was JPY 225 trillion (USD 1.9 trillion), of which the Tokyo Stock Exchange accounted for 90%. Direct access to stock trading on the exchanges is limited to securities companies that meet the requirements and receive the approval of the exchanges. At the end of 2001, the total market value of listed stocks was JPY 301 trillion (USD 2.3 trillion), which was about half the value recorded at the end of 1989, reflecting the decline in stock prices.

The JASDAQ market is an OTC market managed by the Japan Securities Dealers Association (JSDA) in accordance with the provisions of the Securities and Exchange Law. Stock trading on this OTC market is processed and price information provided through the JASDAQ system. Since 1998, a market-maker system, in which trading is based on the quoted prices published by securities companies, has been gradually introduced to the JASDAQ market.

With regard to stock lending, the market has been rapidly expanding since the introduction of a new type of stock lending in 1998, whereby market participants were allowed to make lending transactions without the intermediation of securities finance companies which had been previously required. The outstanding amount of such lending transactions totalled JPY 3.3 trillion (USD 25.1 billion) at the end of 2001. Major participants in this market include securities companies, institutional investors and trust banks.

4.5.2 Clearing and settlement

Settlement of stock transactions currently takes place on a T+3 basis. A large portion of stock transactions, both in the exchange-traded and OTC markets, is settled by book entry at JASDEC. In fiscal 2001, the daily average volume of transactions settled over JASDEC was 146,900. Procedures regarding clearing and DVP arrangements, however, vary according to the type of transaction, and are summarised as follows.

4.5.2.1 Transactions on stock exchanges

Stock exchanges provide pre-settlement services such as trade confirmation and netting for transactions that are conducted on the exchanges.

For stock transactions on the Tokyo Stock Exchange, the Osaka Securities Exchange and the Nagoya Stock Exchange, the exchanges themselves act as central counterparties (CCPs). These three exchanges bilaterally offset obligations vis-à-vis their respective participants, thereby achieving multilateral netting among participants. In this process, obligations to deliver stocks are netted by issue, and obligations to transfer funds are netted across all issues.

With regard to stock transactions made on the other two exchanges, obligations to deliver stocks are netted on a multilateral basis by issue, and obligations to transfer funds are netted on a multilateral basis across all issues. In a legal sense, however, these exchanges do not function as CCPs.

Regarding stock transactions on the Tokyo Stock Exchange and the Osaka Securities Exchange, DVP[40] was achieved in May 2001 by linking the delivery of stocks at JASDEC with the settlement of funds at the Bank of Japan via each CCP. DVP settlement takes place in the following manner: (1) participants with net debit balances in securities are required to deliver securities to the account of the exchange held at JASDEC by 13:00; participants with net debit balances in funds are required to transfer funds to the account of the exchange held at settlement banks[41] by 14:15; (2) after the exchange confirms receipt of securities and funds, it transfers these to participants with net credit balances in securities or funds respectively. The delivery of stocks traded on the other exchanges is also made through the book-entry system of JASDEC, but DVP has not been available.

4.5.2.2 Transactions in the JASDAQ market

Stock transactions on the JASDAQ market are confirmed by Jasdaq Market, Inc, the operator and the CCP of the JASDAQ market.

Transfers of both securities and funds take place on a gross basis, but DVP has not yet been achieved. Stocks are delivered from the seller to the buyer through the account of Jasdaq Market, Inc held at JASDEC. Funds are transferred from the buyer to the seller through the account of Jasdaq Market, Inc held at a designated settlement bank.

Starting in January 2003, stocks traded on all five exchanges and in the JASDAQ market are scheduled to be settled on a DVP basis, using the Japan Securities Clearing Corporation, a newly established unified CCP that will provide clearing services quite similar to those of the Tokyo Stock Exchange.

4.5.2.3 Other transactions[42]

For confirmation of stock transactions by institutional investors, JASDEC has developed a pre-settlement matching system, which started operation in September 2001. Users of this system include investment trusts/advisories, trust banks, custodian banks and life/non-life insurance companies, as well as securities companies. In addition to stock transactions by domestic institutional investors, the system started handling cross-border transactions and trades in convertible bonds in February 2002.

JASDEC also effects settlements of the transactions between securities companies and institutional investors, although DVP is not yet available for these. Market participants and JASDEC, however, are currently considering introducing a DVP mechanism[43] for such settlements in 2004, utilising a CCP that will be newly established as a subsidiary of JASDEC.

4.6 Use of securities infrastructure by the central bank

The BOJ-NET JGB Services, an online transfer system of JGBs, is used for JGB-related services such as issuance and payment of principal and interest, as well as for settlement of JGB transactions between financial institutions. The BOJ-NET JGB Services provides online processing of JGB issuance, from announcement of auction to initial deposit of newly issued JGBs, enabling relevant funds transfers between the government and financial institutions to be processed efficiently. In addition, for the Bank of Japan's open market transactions to be settled smoothly, the BOJ-NET JGB Services is connected with the Bank's systems for open market operations, which handle services such as announcement of offers, acceptance of bids and notification of results.

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[40] Transfer instructions for both securities and funds are settled on a net basis.

[41] The Bank of Japan is one of the settlement banks.

[42] Transactions outside the stock exchanges and the JASDAQ market, including those between securities companies and institutional investors.

[43] Securities transfer instructions are settled on a gross basis and funds transfer instructions are settled on a net basis.

The BOJ-NET JGB Services is also utilised for managing securities pledged by financial institutions as collateral for the Bank's credit extension.[44] The majority of the pledged securities are JGBs, while various other securities, including corporate bonds, municipal bonds, asset-backed securities and CP, are also eligible as collateral under certain conditions. In daily operations, for example, financial institutions post their book-entry JGBs to the Bank as collateral for an intraday overdraft or for some other liquidity provision by the Bank (this is carried out either well in advance or at the time when the overdraft or liquidity is actually to be used); they then receive the pledged JGBs from the Bank against repayment of the intraday overdraft or other liquidity provision by the Bank. To process and manage this series of operations efficiently, financial institutions use the BOJ-NET Credit-Collateral Management System, which was introduced in January 2001. This system is connected with the BOJ-NET JGB Services to achieve online processing of collateral transactions and credit extensions by the Bank including intraday overdrafts, electronic loans and purchases of bills, thereby facilitating the centralised management of these transactions.

4.7 Reform of securities settlement systems

4.7.1 Need for reform

It has been recognised that there is room for improvement in Japan's securities settlement systems in terms of safety and efficiency.

First, securities settlement has been conducted based on different laws for different types of securities, and there is no rule that uniformly covers settlement of all types of securities and allows securities to be dematerialised and settled by book entry. This has resulted in complexity in securities settlement systems, and has also been an impediment to improving the settlement of securities such as CP and corporate bonds.

Second, DVP has not been available for some types of securities such as CP and stocks traded outside the exchanges. Given the significant systemic implications of settlements and corresponding payments for such securities, implementation of DVP in this area is essential.

Third, the move towards shorter settlement cycles and further progress in straight through processing (STP), which is useful for the realisation of shorter settlement cycles, has been slow compared to other major markets. This may lead to a delay in reducing market exposure and counterparty risk related to securities transactions.

4.7.2 Recent developments

With respect to the legal framework, the Law Concerning Book-Entry Transfer of Short-Term Corporate Debt Securities was enacted in June 2001 (effective from April 2002), allowing the establishment of a book-entry system without a tiered structure (ie a direct holding system without intermediaries) for dematerialised CP. The law was amended and renamed the Law Concerning Book-Entry Transfer of Corporate and Other Debt Securities in June 2002 (effective from January 2003), enabling dematerialisation and book-entry transfers in a tiered structure system for various types of debt securities including CP, corporate bonds and JGBs. In addition, the amended Securities and Exchange Law will provide a legal and regulatory framework for clearing institutions (CCPs) for securities trades from January 2003.

In addition to the legal aspect above, relevant parties have made steady efforts with respect to the following: (1) establishment of book-entry systems for CP and corporate and other bonds; (2) introduction of a DVP mechanism for transactions in CP and stocks traded outside the exchanges; (3) establishment of CCPs for stocks on and off the exchanges and for JGBs; and (4) realisation of STP by introducing systems for trade or pre-settlement confirmation for various types of securities.

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[44] The Bank made public in October 2000 its Guidelines on Eligible Collateral stating the principles, categories, and prices of collateral, as well as the eligibility standards for its collateral management. Eligibility of collateral is based on the following principles: (1) maintaining the soundness of the Bank's assets; (2) ensuring smooth business operation of the Bank and efficient use of collateral; and (3) utilising market information. Categories of eligible collateral include various securities such as JGBs, government-guaranteed bonds, municipal bonds, corporate bonds, bills, CP and loans on deeds.

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