BOJ Reports & Research Papers

Payment and Settlement Systems Report

2012-2013

Bank of Japan

November 2013

This document is an abridged English translation of the Japanese original published on October 11, 2013.

Payment and Settlement Systems Department, Bank of Japan
P.O. Box 30, Nihonbashi, Tokyo 103-8660, Japan
Fax: +81-3-3548-2317
e-mail: post.pr@boj.or.jp

Introduction

The *Payment and Settlement Systems Report* is designed to present an overview of developments in payment and settlement systems in Japan, and the initiatives taken by the Bank of Japan and the private sector to further improve the safety and efficiency of payment and settlement systems. This issue, *Payment and Settlement Systems Report 2012-2013*, reviews primarily events that took place between July 2011 and September 2013.

Following the global financial crisis, various measures have been taken internationally to strengthen regulations and develop or enhance international standards to improve the safety of payment and settlement systems. For over-the-counter (OTC) derivatives transactions, for example, the use of central counterparties (CCPs) and reporting to trade repositories have been required in many countries, based on the commitment of the Group-of-Twenty (G20) Leaders at the Pittsburgh Summit meeting. The Committee on Payment and Settlement Systems of the Bank for International Settlements and the Technical Committee of the International Organization of Securities Commissions conducted a comprehensive review of international standards used in the oversight of payment and settlement systems and released in April 2012 the *Principles for Financial Market Infrastructures* (the PFMIs).

In Japan also, risk management has been enhanced in financial market infrastructures (FMIs) in line with the PFMIs. In the OTC derivatives market, clearing services for credit default swaps and interest rate swaps were launched, and a trade repository was established. Integration and merger have taken place among CCPs. At the same time, the Bank released *The Bank of Japan Policy on Oversight of Financial Market Infrastructures* in March 2013 and has conducted oversight of FMIs based on the updated policy.

Steady progress was also seen in the initiatives for establishing new payment and settlement infrastructures. In November 2011, the change-over to the 6th-generation Zengin System, which adopts internationally accepted standards, and the implementation of the Next-Generation RTGS project of the BOJ-NET, which the Bank had been working on since 2006, was completed. At present, work is continuing to establish the new BOJ-NET system, shorten the settlement cycle for Japanese government bonds (JGBs) to T+1, and enhance business payments.

As one of the critical infrastructures supporting society, payment and settlement systems need to quickly respond to changes in their environment, including the globalization of financial markets and advances in technology, in order to offer a higher level of efficiency and accessibility. The Bank has been working to improve the safety and efficiency of payment and settlement systems in close cooperation with payment and settlement system operators at home and abroad, participating financial institutions, overseas central banks, and relevant authorities. The Bank will continue to make every effort to improve payment and settlement services in cooperation with relevant parties, while making effective use of the functionalities of the new BOJ-NET system.

Table of Contents

Abbreviations

BOJ-NET	Bank of Japan Financial Network System
CCP	central counterparty
CPSS	Committee on Payment and Settlement Systems of the Bank for International Settlements
DDRJ	DTCC Data Repository Japan
DFTS	Domestic Fund Transfer System
DNS	deferred net settlement
DVP	delivery-versus-payment
EDI	electronic data interchange
EMEAP	Executives' Meeting of East Asia-Pacific Central Banks
FMI	financial market infrastructure
FSA	Financial Services Agency
FXYCS	Foreign Exchange Yen Clearing System
IOSCO	International Organization of Securities Commissions
JASDEC	Japan Securities Depository Center
JBA	Japanese Bankers Association
JDCC	JASDEC DVP Clearing Corporation
JGB	Japanese government bond
JGBCC	Japan Government Bond Clearing Corporation
JSCC	Japan Securities Clearing Corporation
LSF	liquidity-saving features
OSE	Osaka Securities Exchange
OTC	over-the-counter
PFMIs	Principles for Financial Market Infrastructures
PVP	payment-versus-payment
Q/O accounts	queuing and offsetting accounts
RTGS	real-time gross settlement
RTGS-XG	Next-Generation RTGS
TFX	Tokyo Financial Exchange
TSE	Tokyo Stock Exchange
XML	Extensible Markup Language
Zengin-Net	Japanese Banks' Payment Clearing Network
Zengin System	Zengin Data Telecommunication System

Executive Summary

I. Developments in Payment and Settlement Activity

Payment and settlement activity in Japan for fiscal 2012 shows that the value and volume of large-value payments in the BOJ-NET, yen payments associated with foreign exchange and other transactions in the CLS system, and payments in the Zengin System all increased compared with those of the previous year, reflecting an increase in the level of financial market activity. Similarly, the value and volume of securities settlement on the whole rose above the levels of the previous year.

Activity in non-cash retail payments shows that credit cards remain by far the most widely used payment instrument. They have been on an uptrend in terms of both value and volume of transactions. Electronic money has shown strong growth in value and volume owing to the expansion of the environment supporting its use, such as the increase in the number of electronic money cards issued and the number of terminals accepting electronic money. At the same time, non-bank funds transfer service providers have gradually increased in number, while the use of third-party bill payment services at convenience stores and cash-on-delivery services by package delivery service providers have also continued to increase. With respect to payments between businesses, densai.net Co., Ltd. began its operations in February 2013, and the use of electronically recorded monetary claims has been spreading among a large number of businesses.

Outside of Japan, retail payment services which allow for speedy completion of credit transfers and are available around-the-clock have been developed in the United Kingdom, with similar initiatives also seen in Australia, the United States, and other countries.

II. Enhancement of the Framework for Improving Safety and Efficiency

The Committee on Payment and Settlement Systems of the Bank for International Settlements and the Technical Committee of the International Organization of Securities Commissions conducted a comprehensive review of international standards used in the oversight of payment and settlement systems and released in April 2012 the *Principles for*

Financial Market Infrastructures (the PFMIs). The PFMIs introduced or raised minimum requirements in many areas, reflecting the lessons learned from the global financial crisis.

In March 2013, the Bank of Japan further updated its oversight policy and released *The Bank of Japan Policy on Oversight of Financial Market Infrastructures*, which has been in effect since April 2013. The oversight policy explicitly states that the Bank uses the PFMIs as the standards for the assessment of safety and efficiency of systemically important financial market infrastructures (FMIs).

III. Initiatives on Payment and Settlement Systems

In light of the publication of the PFMIs and relevant guidelines, private-sector FMIs in Japan have reviewed their operations and risk management frameworks, and have taken initiatives to adopt measures for improvements. Meanwhile, Japan Securities Clearing Corporation (JSCC) has launched clearing services for credit default swaps and interest rate swap transactions, while DTCC Data Repository Japan was established as a trade repository. Moreover, in July 2013, the clearing functionality of derivatives listed on Osaka Securities Exchange (OSE) was integrated from OSE to JSCC. JSCC, in turn, merged with Japan Government Bond Clearing Corporation (JGBCC) in October 2013.

The Next-Generation RTGS (RTGS-XG) project of the BOJ-NET Funds Transfer System was completed in November 2011, having shifted all large-value payments in Japan, i.e., payments in the Foreign Exchange Yen Clearing System (FXYCS) and large-value payments in the Zengin System, to settlement on a real-time gross settlement (RTGS) basis. The Bank is currently establishing a new system platform for the BOJ-NET, with the aim of flexibly responding to future changes in financial services.

In terms of cooperation with other central banks, in November 2011, the Bank introduced a cross-border collateral arrangement with the Bank of Thailand (BOT), which would allow BOT to provide liquidity in Thai baht utilizing Japanese government bonds (JGBs) as collateral. In July 2013, the Bank also agreed with the Monetary Authority of Singapore on the establishment of a similar arrangement.

As a market-wide initiative, discussions have continued among market participants with the target of implementing a T+1 settlement cycle for outright JGB transactions as early as

possible in 2017 or thereafter. Initiatives to enhance business payments by linking payment information and remittance information are also under way.

IV. Initiatives for Strengthening Business Continuity Arrangements

Payment and settlement systems are important social infrastructures and should have in place business continuity arrangements that address a wide range of events posing a risk of operational disruptions. Based on the lessons learned from the Great East Japan Earthquake of 2011 and in light of the strengthened standards for business continuity in the PFMIs, efforts are being made to strengthen the business continuity arrangements of private-sector payment and settlement systems. Such efforts include review of disaster scenarios, development of detailed guidelines for business continuity plans, enhancement of in-house power generating capabilities, and enhancement of emergency personnel and back-up arrangements. At the market level and in the financial services industry as a whole, joint exercises have been conducted with the participation of a wide range of entities.

The Bank has also worked to strengthen its business continuity arrangements, for example by reviewing its arrangements and conducting exercises, to ensure that it continues to fulfill its responsibilities as a central bank with minimum impact on operations even in the face of a range of disasters.

V. Conclusion

The Bank plans to work on the following issues in the near future in close cooperation with payment and settlement system operators, participating financial institutions, overseas central banks, and relevant authorities.

First, the Bank will steadily push ahead with the establishment of the new BOJ-NET, with the implementation of Phase 1 scheduled in January 2014 and Phase 2 sometime between the autumn 2015 and early 2016.

Second, through its oversight of private-sector FMIs, the Bank will assess the compliance of FMIs against the PFMIs, focusing on requirements that were strengthened or newly introduced, and induce change where necessary.

Third, the Bank will continue to support market participants' initiatives including those on the shortening of the JGB settlement cycle to achieve T+1 for outright transactions and on linking payment information and remittance information in businesses payments.

Fourth, the Bank will continue to cooperate with other central banks and work toward the development and enhancement of cross-border payment systems. It will also continue to work on the development of cross-border collateral arrangements with overseas central banks.

Fifth, the Bank will continue to support business continuity planning at private-sector payment and settlement systems and financial institutions and at the same time support street-wide exercises and other initiatives. The Bank will also work to maintain and further enhance the effectiveness and efficiency of its business continuity arrangements.

I. Developments in Payment and Settlement Activity

A. Large-Value Payments and Securities Settlements

1. Overview

Settlement of financial transactions usually takes the form of payment of funds or delivery of securities. The arrangements for making payments are further classified into the two categories of large-value and retail (Chart I-1).

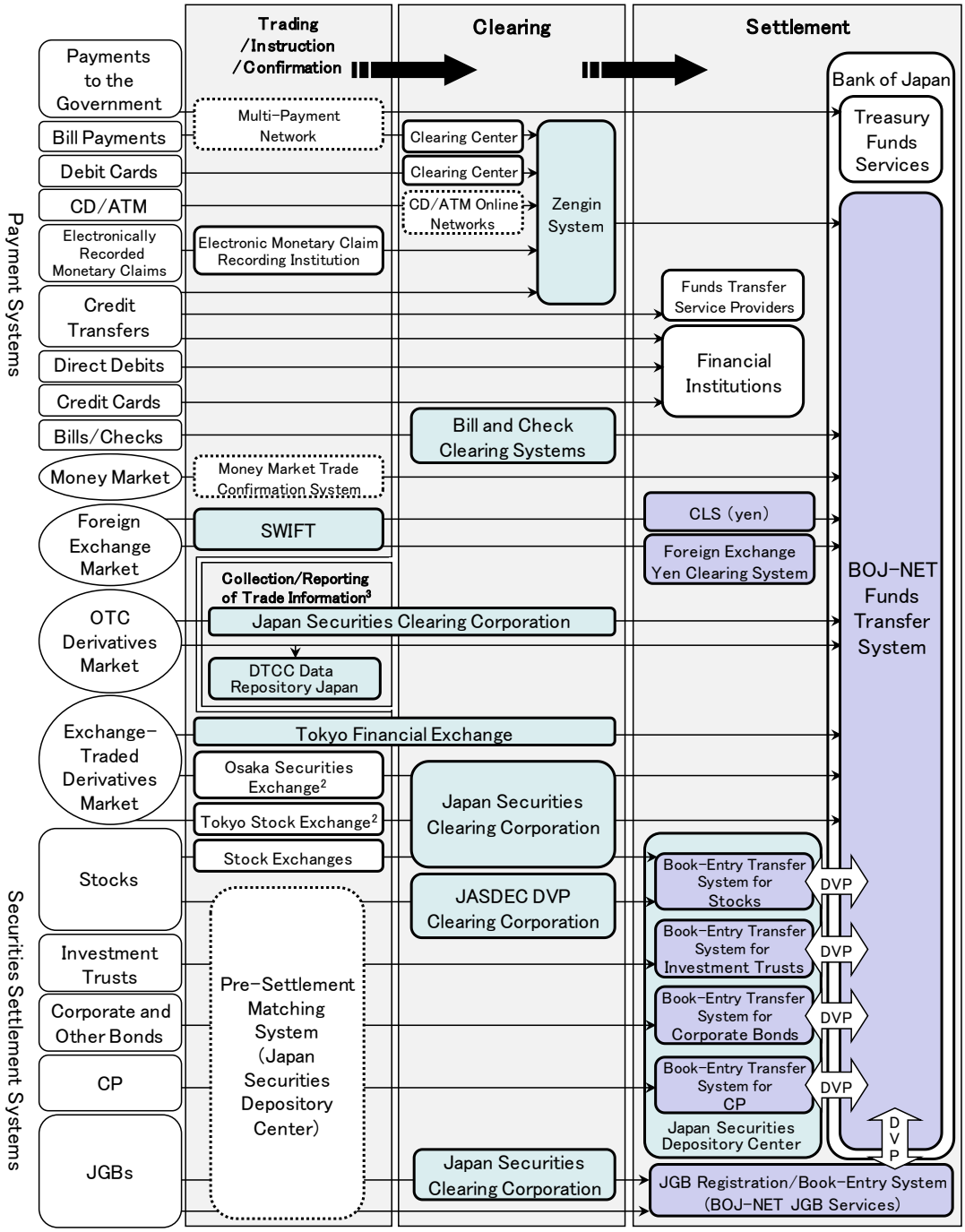
This section reviews developments in large-value payments and securities settlements (Chart I-2). Chart I-2 shows the daily average values and volumes processed by the major payment and settlement systems in Japan for fiscal 2012.

In fiscal 2012, the value and volume of transactions settled through the BOJ-NET Funds Transfer System increased by 6.8 percent and 13.3 percent year-on-year, respectively. This can be attributed to i) the recovery of trading of Japanese government bonds (JGBs) and other instruments from the sharp fall which had taken place following the global financial crisis; and ii) the impact of the implementation of Phase 2 of the Next-Generation RTGS (RTGS-XG) project of the BOJ-NET (to be discussed in Chapter III, Section B, 1. a.), which has shifted large-value payments in the Zengin System (defined as payments equal to or above 100 million yen) from settlement on a deferred net settlement (DNS)[1] basis to real-time gross settlement (RTGS)[2] in the BOJ-NET Funds Transfer System.

[1] Settlement of obligations between or among counterparties on a net basis at some later time.

[2] Continuous settlement of funds or securities transfers individually on an order-by-order basis.

Chart I-1　Overview of Payment and Settlement Systems in Japan[1]



Notes: 1. Systems surrounded by a dotted line are used in some instruction, confirmation, and clearing activities.

2. The derivatives market of Tokyo Stock Exchange is scheduled to be integrated under Osaka Securities Exchange in March 2014.

3. Japan Securities Clearing Corporation (JSCC) is required to collect and report data to relevant authorities for OTC derivatives transactions it has cleared. Transactions not cleared by JSCC are required to be reported to authorities either via the DTCC Data Repository Japan or directly by financial institutions.

Chart I-2 Average Daily Value and Volume of Transactions Processed by Major Payment and Settlement Systems in Japan

Large-value Payments	Value (trillion yen)	Year-on-year growth (%)	Volume (thousands)	Year-on-year growth (%)
BOJ-NET Funds Transfer System	112.0	6.8	62.9	13.3
of which: interbank transfers	40.6	2.9	—	—
DVP for JGBs	42.7	8.9	—	—
Large-value Zengin System payments[2]	8.1	2.6 times	—	—
CLS (yen payments)	35.3	9.4	81.9	3.9
Foreign Exchange Yen Clearing System (FXYCS)	10.3	-8.9	26.0	1.0
Zengin System[3]	11.0	4.1	5985.8	4.8
Bill and Check Clearing Systems[4]	1.1	-6.2	100.3	-5.1

Securities Settlements	Value (trillion yen)	Year-on-year growth (%)	Volume (thousands)	Year-on-year growth (%)
BOJ-NET JGB Services	84.9	8.1	17.2	4.5
Japan Government Bond Clearing Corporation (JGBCC)[5]	45.6	17.9	—	—
Japan Securities Clearing Corporation (JSCC)[5]	1.8	14.0	—	—
JASDEC DVP Clearing Corporation (JDCC)[5]	0.9	3.8	80.2	-2.8
Japan Securities Depository Center (JASDEC)[6]				
of which: stocks	—	—	343.6	3.5
dematerialized CP	5.0	0.1	1.2	1.9
corporate and other bonds	0.9	-4.1	2.2	6.5
investment trusts	0.8	12.6	18.9	10.5

Notes: 1. Figures are average daily value and volume for fiscal 2012.
2. In calculating the year-on-year growth for large-value Zengin System payments, the daily value of transactions for fiscal 2011 is calculated by dividing the total transaction value after November 16, 2011, the date of implementation of Phase 2 of the RTGS-XG project, by the number of business days in fiscal 2011 (246 days) .
3. Figures for the Zengin System show the value and volume of payments processed.
4. Figures for bill and check clearing systems show the value and volume of bills and checks processed at the Tokyo Clearing House.
5. Figures for JGBCC, JSCC, and JDCC show the value of transactions processed by the central counterparties (CCPs). Figures for JSCC are for stock transactions executed on stock exchanges. Figures for JDCC are for stocks traded off exchange between securities companies and their customers.
6. Figures for stocks show the total amount of issuance and redemption. Figures for dematerialized CP and corporate and other bonds show the total amount of underwriting, transfers, redemption, and redemption by purchase. Figures for investment trusts show the total amount of sale, repurchase, and redemption.

Yen payments arising from foreign exchange (FX) transactions and others show that while the value of payments processed by the Foreign Exchange Yen Clearing System (FXYCS) declined, the value of yen payments processed by the CLS system increased, resulting in a further increase in the percentage of transactions settled via CLS. CLS settles FX transactions for the major currencies on a payment-versus-payment (PVP)[3] basis.

The value and volume of retail credit transfers processed by the Zengin System (which includes payments of less than 100 million yen in addition to the large-value Zengin System payments mentioned earlier) increased by 4.1 percent and 4.8 percent year-on-year, respectively.

Turning to securities settlement systems, owing in part to the recovery of JGB market activity from a sharp fall following the global financial crisis, the settlement value and volume of JGB transactions settled in the JGB Registration and Book-Entry System increased by 8.1 percent and 4.5 percent year-on-year, respectively. In addition, the value of transactions cleared by Japan Government Bond Clearing Corporation (JGBCC) increased sharply by 17.9 percent. As for stocks, partly due to the increase in market activity in the rising phase of stock prices from the end of 2012, both the value of transactions cleared by Japan Securities Clearing Corporation (JSCC) and the volume of transactions settled by the Book-Entry Transfer System for Stocks operated by Japan Securities Depository Center (JASDEC) increased by 14.0 percent and 3.5 percent year-on-year, respectively.

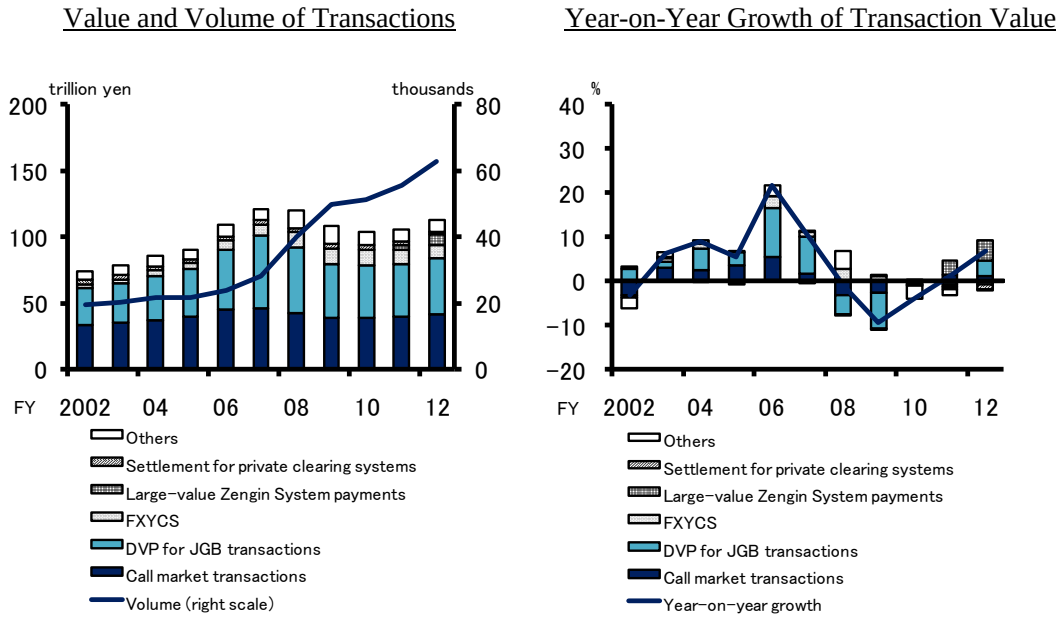
2. Developments in the BOJ-NET

In fiscal 2012, both the value and volume of payments settled in the BOJ-NET Funds Transfer System increased from the previous year (Chart I-3). This can attributed to i) the recovery of JGB market activity from a sharp fall following the global financial crisis; and ii) the fact that the implementation of Phase 2 of the RTGS-XG project (which will be described later) has shifted large-value Zengin System payments to RTGS in the BOJ-NET. Reflecting

[3] A mechanism in the settlement of FX transactions which ensures that a final transfer of one currency occurs if, and only if, a final transfer of the other currency or currencies takes place. Similarly, a link between a securities transfer and a funds transfer that ensures that delivery occurs if, and only if, payment occurs is called delivery-versus-payment (DVP).

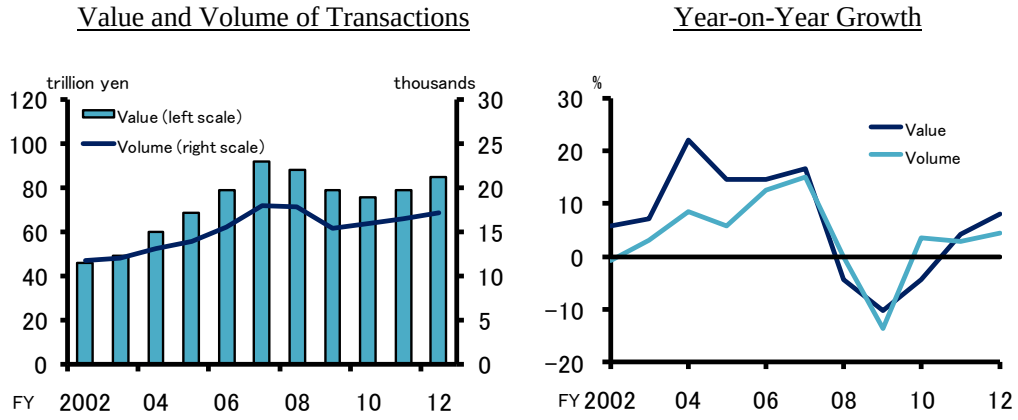
the increase in JGB transactions, the value and volume of JGBs settled in the BOJ-NET JGB Services have also been on an upward trend (Chart I-4).

Chart I-3　Average Daily Value and Volume of Payments Processed by the BOJ-NET Funds Transfer System



Source: Bank of Japan.

Chart I-4　Average Daily Value and Volume of JGBs Processed by the BOJ-NET JGB Services



Source: Bank of Japan, *Payment and Settlement Statistics*.

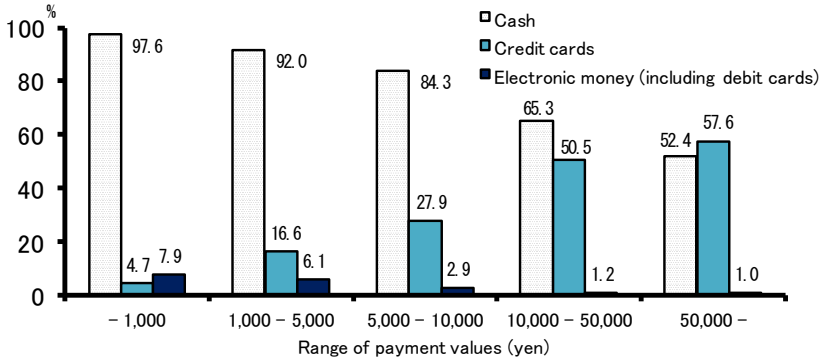
B. Retail Payments

1. Major retail payment instruments

a. Credit cards, electronic money, and debit cards

In Japan, cash, credit cards, electronic money,[4] and debit cards are used daily as payment instruments for shopping at the point-of-sales (POS). Cash is the most commonly used payment instrument for transactions of 50,000 yen or less (Chart I-5).

Chart I-5 Payment Instruments for Ordinary Expenditures



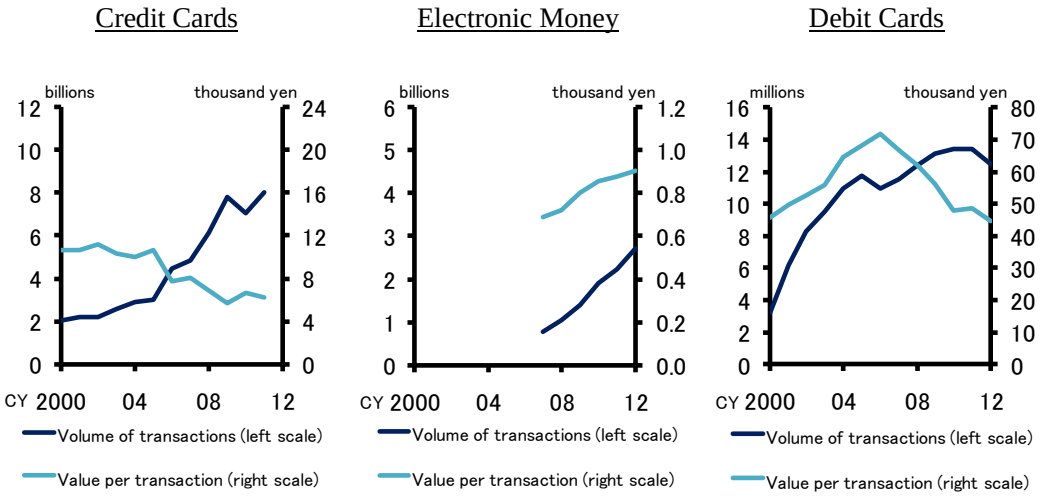
Notes: 1. In the *Public Opinion Survey on Household Financial Assets and Liabilities (households with at least two persons)* conducted by the Central Council for Financial Services Information in 2012, the respondents were asked the question, "For ordinary expenses (such as shopping), which payment instruments do you use for different values of payment? Please choose the instruments which are used frequently for each range of payment values (choose up to two answers)." The number of non-respondents is not included in the denominator when calculating the percentage of use.
2. The results for "others" are not included in the chart.
Source: The Central Council for Financial Services Information.

The transaction volume and the range of payment values vary for credit cards, electronic money, and debit cards, reflecting various factors such as the differences in the degrees of diffusion and availability of merchants accepting these instruments.

[4] Among the various electronic retail payment instruments, "electronic money" generally refers to a payment instrument which requires users to load a certain value before use (pre-paid type). Among electronic money in which a contactless integrated circuit (IC) chip is embedded, this report covers eight brands provided by three types of issuers, i.e. electronic money service providers (Rakuten Edy), public transportation service providers such as railway companies (ICOCA, Kitaca, PASMO, SUGOCA, and Suica), and retail companies (nanaco, WAON).

Firstly, the annual number of credit card transactions continued to increase, albeit with some fluctuations, and reached 8 billion in 2011 (Chart I-6). As credit cards were increasingly used also for smaller-value transactions, the average value per transaction declined by about 40 percent from the early 2000s to about 6,000 yen in 2011. Secondly, the annual number of electronic money transactions increased to the recent figure of 2.5 billion against the backdrop of the expansion of environment supporting its use (which will be discussed later). The average value per transaction for electronic money has climbed to about 900 yen partly due to an increase in its use at supermarkets and other venues, where the range of values to be paid by this instrument is relatively high. On the other hand, the average value per transaction for debit cards has declined to about 40,000–50,000 yen from its peak of about 70,000 yen in fiscal 2006. The annual number of debit card transactions has remained unchanged at around 13 million.

Chart I-6 Transaction Volume and Average Value per Transaction for Major Payment Instruments

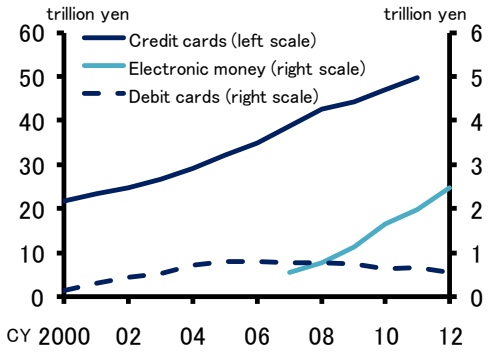


Notes: 1. The volume of transactions for credit cards is estimated by the Bank based on the results of a survey by the Japan Consumer Credit Association.
2. The figures for electronic money are based on data in *Recent Developments in Electronic Money in Japan* (November 2012, Bank of Japan), with figures for 2012 calculated by extending the data to December 2012. The figures for 2007 are for the 9 months from April to December.

Sources: Japan Consumer Credit Association; Bank of Japan; Japan Debit Card Promotion Association.

With respect to annual value of transactions, the value for credit cards has jumped from about 20 trillion yen to about 50 trillion yen in the last decade (Chart I-7). The annual value of electronic money transactions has risen to slightly more than 2 trillion yen, owing to increases both in the transaction volume and in the average value per transaction. On the other hand, the annual value of debit card transactions has been on a moderate downtrend reflecting the decline in the average value per transaction and has stayed at around 600 billion yen.

Chart I-7 Annual Transaction Value for Major Retail Payment Instruments



Note: The figures for electronic money are based on data in *Recent Developments in Electronic Money in Japan*, with figures for 2012 calculated by extending the data to December 2012. The figures for 2007 are for the 9 months from April to December.
Sources: Japan Consumer Credit Association; Bank of Japan; Japan Debit Card Promotion Association.

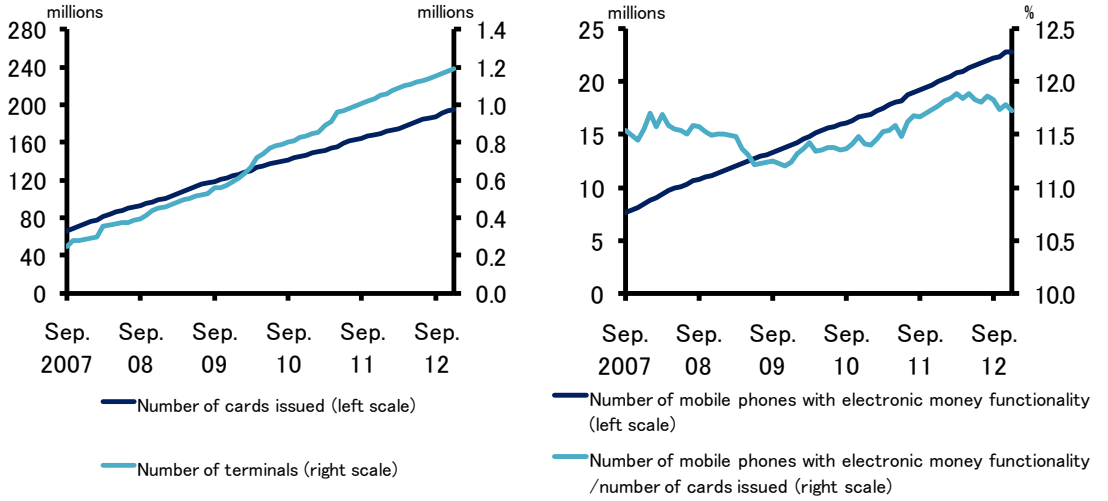
A comparison of the three retail payment instruments shows that the value and volume of transactions are the largest for credit cards, which are the second most widely used payment instrument after cash. While small in terms of value, the volume of electronic money transactions is now equal to about 30 percent of that of credit cards, and its use is increasing particularly in the range of relatively small-value transactions. Both the transaction value and volume for debit cards are smaller than those for the other two instruments.

b. The environment for use of electronic money

The increases in the value and volume of electronic money transactions in recent years may be attributed to the expansion of the environment supporting its use as well as the increase in the number of electronic money cards issued (the left-hand side of Chart I-8). First, the

number of terminals for accepting electronic money payments installed at retail outlets and other locations exceeded 1 million in September 2011 and reached 1.18 million in December 2012. In the meantime, the number of mobile phones capable of recording and storing the value of electronic money has also continued to increase, with its share in the total number of electronic money devices reaching almost 12 percent (the right-hand side of Chart I-8).

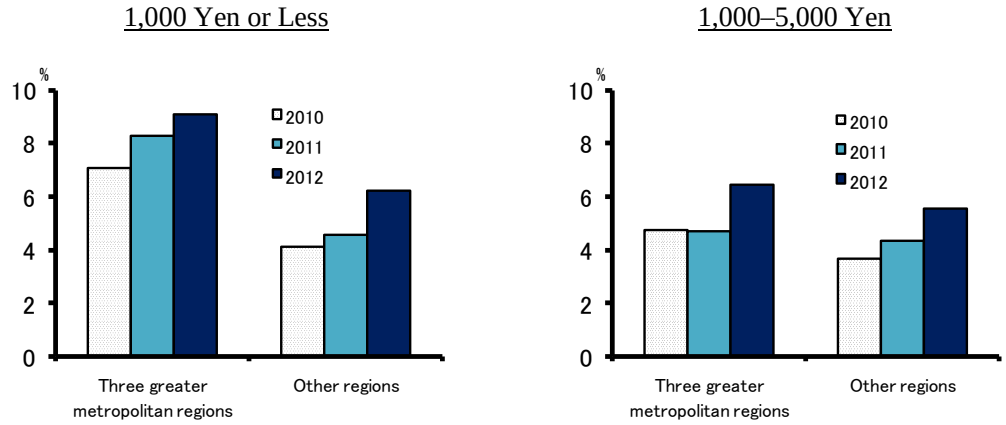
Chart I-8 Developments in the Environment Supporting the Use of Electronic Money



Note: The figures for electronic money are based on data in *Recent Developments in Electronic Money in Japan*, with figures for 2012 calculated by extending the data to December 2012.
Source: Bank of Japan.

However, these developments in the environment for the use of electronic money vary from region to region. An analysis of results of a questionnaire survey on the daily use of payment instruments, by the range of values to be paid and by region (Chart I-9), shows that while in the value range of 1,000 yen or less per payment, the share of electronic money usage is higher in the three greater metropolitan regions (Kanto, Chubu, and Kinki regions) than in other regions, there is no significant regional variance in the value range of 1,000–5,000 yen. A possible explanation for this phenomenon is that the use of electronic money in convenience stores and outlets on the premises of railway stations, where most of the payments are likely to be for 1,000 yen or less, is more common in the urban regions. On the other hand, there is no significant difference in the use of electronic money between the three greater metropolitan regions and other regions for shopping at large retail outlets, where most payments are in the 1,000–5,000 yen range.

Chart I-9 Percentage of Use of Electronic Money by Region and Range of Payment Value



Notes: 1. In the *Public Opinion Survey on Household Financial Assets and Liabilities (households with at least two persons)* conducted by the Central Council for Financial Services Information in 2012, the respondents were asked the question, "For ordinary expenses (such as shopping), which payment instruments do you use for different values of payment? Please choose the instruments which are used frequently for each range of payment values (choose up to two answers)." The number of non-respondents is not included in the denominator when calculating the percentage of use.

2. The regions are classified into "three greater metropolitan regions" (Kanto, Chubu, and Kinki) and "other regions" (Hokkaido, Tohoku, Hokuriku, Chugoku, Shikoku, and Kyushu).

Source: The Central Council for Financial Services Information.

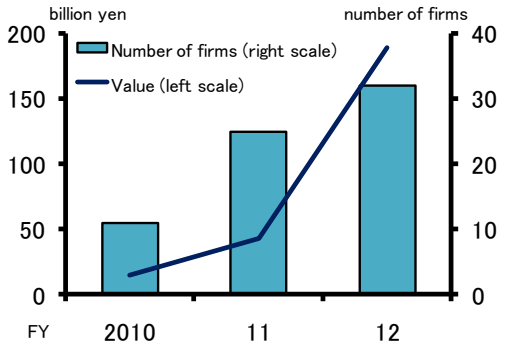
2. New developments in retail payments

a. Funds transfer services

Since the Payment Services Act came into force in April 2010, businesses other than banks have been allowed to engage in funds transfer services when the amount of funds to be transferred per customer request does not exceed 1 million yen. The value of payments handled by business entities registered to engage in funds transfer services (funds transfer service providers) stood at 188.6 billion yen in fiscal 2012 (Chart I-10). Against the backdrop of their low fees and the convenience offered by availability of the service over the Internet, these services are used for small-value payments to overseas to pay for purchases of

goods and services and for remittances to family members living abroad.[5] Businesses registered as funds transfer service providers numbered 32 as of the end of fiscal 2012. These included not only those which had been engaged in overseas funds transfer services before the enactment of the Payment Services Act, but also other entities, such as consumer credit companies and mobile phone operators.

Chart I-10 Use of Funds Transfer Service Providers



Note: Total for fiscal year.
Source: Japan Payment Service Association.

b. Third-party bill payment services and cash-on-delivery services

In Japan, in addition to funds transfer services, other retail payment services, such as third-party bill payment services and cash-on-delivery services have been used increasingly

[5] The *Report on the Results of a Survey on Remittance Services*, released by the Japan Payment Service Association in August 2012, presents the results of a questionnaire survey on the use of funds transfer service providers in detail, focusing on the use of these service providers for overseas remittances. According to the report, the purposes of using these service providers for overseas remittance include payments for purchases of goods and services (59.3 percent of responses) and remittances to family members (31.1 percent). The report states that the high customer satisfaction level for the use of overseas remittance service by these providers can be attributed to their low fees and the availability over the Internet.

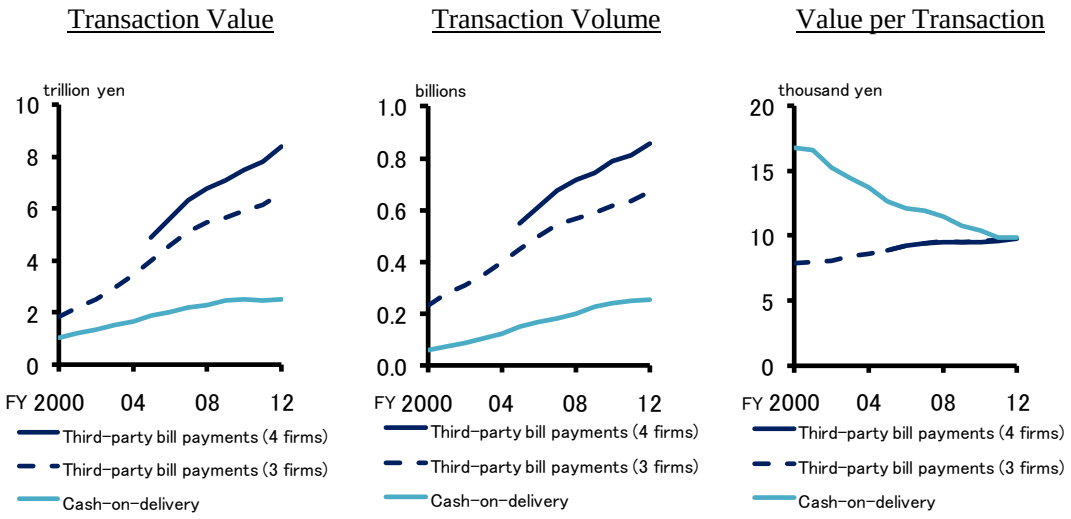
widely in recent years. At present, these services are operated under the self-regulation of the industry or firms that provide them.[6]

Third-party bill payment service refers to the mechanism under which the buyer (debtor) makes a payment for merchandise or a service to one of the convenience stores or other third-party bill payment service providers designated by the seller, and the bill payment service provider delivers the payment to the seller. This service is widely used because it is available at convenience stores, whose outlets are often open 24 hours a day, and for relatively low fees. Both the value and the volume of transactions for this service (on the basis of the four major convenience store operators) have continued to increase, against the background of the enhanced convenience due to the increase in the number of outlets providing the service and the expansion of the types of payments accepted, which now include payments to government agencies. In fiscal 2012, the value and volume of transactions stood at approximately 8 trillion yen and about 800 million, respectively (Chart I-11). Average value per transaction was about 10,000 yen, having increased by about 20 percent from the early 2000s.

Cash-on-delivery service refers to the mechanism under which the package delivery company designated by the seller of the merchandise (creditor) delivers the merchandise to the buyer (debtor) in exchange for the payment for it and then delivers the payment to the seller. The DVP nature of the service offers advantages in terms of safety and, with increasing demand for payments for commercial transactions over the Internet (e-commerce), the value and volume of transactions for this service (on the basis of two major package delivery companies) in fiscal 2012 reached about 2 trillion yen and about 200 million, respectively. The average value per transaction under this method in fiscal 2012 was about 10,000 yen, having declined by some 40 percent from the early 2000s due to the increase in its use in the range of smaller-value payments.

[6] For example, the industry is working on measures to prevent the buyers of goods and services (debtors) who have already made payment from being charged again by the seller (creditors) in the event a bill payment service provider or cash-on-delivery service provider goes bankrupt. One such measure is clearly articulating that the service provider accepts the payment as an agent of the provider of goods and services, so that the obligation of the buyer (debtor) is discharged once the payment from the debtor is received by the convenience store or the package delivery company. In addition, many of these payment service providers set a ceiling on the amount of payment per customer request.

Chart I-11　Use of Third-Party Bill Payment and Cash-on-Delivery Services



Notes: 1. "Third-party bill payments (3 firms)" are the total for Seven-Eleven Japan (Seven & i Holdings), Lawson, and UNY Group Holdings (Circle K Sunkus). "Third-party bill payments (4 firms)" are the total for the 3 firms mentioned above and Familymart. Value and volume of transactions are the total for their fiscal year ending February of the following year.
2. "Cash-on-delivery" is the total for Yamato Holdings and SG Holdings (the two firms have more than 80 percent share in package delivery services by trucks, according to a survey by the Ministry of Land, Infrastructure, Transport, and Tourism). The transaction value for Yamato Holdings is estimated by multiplying the transaction volume of Yamato Holdings by the value per transaction of SG Holdings. Value and volume of transactions are the total for fiscal year.

Sources: Seven & i Holdings; Lawson; Familymart; UNY Group Holdings; Yamato Holdings; SG Holdings.

c. The use of electronically recorded monetary claims in business payments

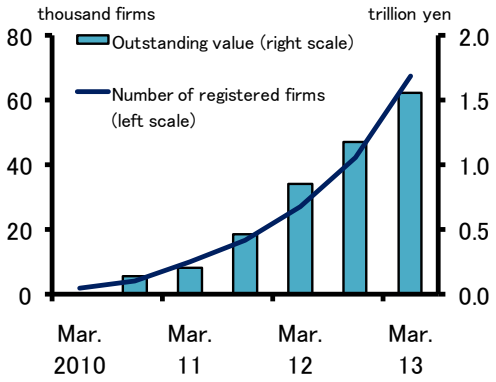
One development that has been attracting attention in the field of business payments in recent years is the increasing use of electronically recorded monetary claims.[7] These are a new type of monetary claims created by the Electronically Recorded Monetary Claims Act, which came into force in December 2008. In the past, the principal means of converting claims arising from commercial transactions into funds were bill discounting or accounts receivable transfer. However, paper-based bills involved safe-keeping costs and the risk of losses from misplacement or theft, while accounts receivable transfer involved the cost of verifying the existence of claims and the risk of duplicate assignments. Electronically recorded monetary claims, on the other hand, operate under a system whereby the accruals,

[7] For recent efforts for enhancing business payments, see Chapter III, Section C, 2. "Enhancing business payments" of this *Report*.

assignments and other transactions associated with the claims are effected through electronic recording into the registry by electronic monetary claims recording institutions, eliminating the challenges associated with the use of bills and accounts receivable. As such, they are expected to contribute to enhancing cash management on the part of businesses.

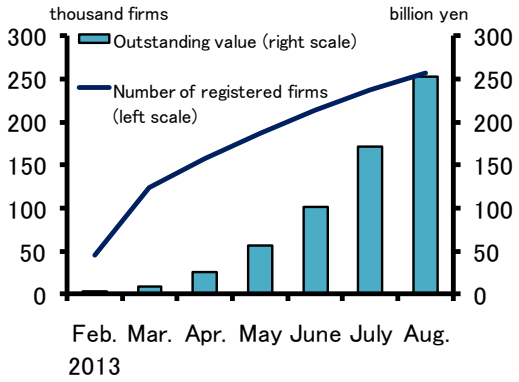
So far, four companies have been designated as electronic monetary claims recording institutions. Between 2008 and 2010, three major banks each founded an electronic monetary claims recording institution and began providing services to their client-firms using electronically recorded monetary claims as an alternative to existing services such as bill discounting and factoring. As of the end of March 2013, the number of companies which had contracts to use this service with any of the above-mentioned three electronic monetary claims recording institutions stood at about 68,000, showing year-on-year increase of 150 percent, and the combined outstanding value of claims handled by these institutions stood at about 1.6 trillion yen, showing year-on-year increase of 82 percent (Chart I-12). In addition, in February 2013, densai.net Co., Ltd., a wholly owned subsidiary of the Japanese Bankers Association (JBA), started its electronic monetary claims recording business. Densai.net has adopted an arrangement similar to the current procedures for bills transactions, such as penalties placed on debtors that have failed to make a payment on the value date. With the participation of approximately 500 financial institutions from across the country, densai.net allows user firms to engage in transactions using electronically recorded monetary claims with a broad range of businesses through its member financial institutions. As of the end of August 2013, the number of businesses registered with densai.net stood at about 260,000, while the outstanding value of claims stood at 252.4 billion yen (Chart I-13).

Chart I-12　Use of Electronic Monetary Claims Recording Institutions of Three Major Banks



Note: Total for Japan Electronic Monetary Claim Organization, SMBC Electronic Monetary Claims Recording, and Mizuho Electronic Monetary Claim Recording.
Sources: Japan Electronic Monetary Claim Organization; Bank of Japan.

Chart I-13　Use of densai.net



Source: densai.net.

3. Developments in retail payment systems in other countries

Recent years have seen growing interest in the improvement of retail payment systems in a number of countries outside Japan. Many of such initiatives aim to address challenges associated with their traditional systems, such as the long time lag between payment initiation and crediting of the payee's account, and the lack of functionality for real-time submission and processing of payment instructions. New services offered in some countries also allow for provision of services around-the-clock, including in the evening and on weekends.

For instance, in the United Kingdom, with the introduction of the Faster Payments Service in 2008, credit transfer services are now available 24 hours a day, seven days a week, with the funds credited on the payee's account within two hours after payment initiation.[8] Settlement between member banks takes place on a DNS basis three times per business day.

[8] Singapore also plans to launch a new retail payment infrastructure with characteristics similar to that of the Faster Payments Service in 2014.

In addition, the UK Payments Council, in which major banks and the Bank of England participate, published *The Payments Roadmap – An Initial Report* in June 2013 and is currently working to develop a roadmap that sets out the strategic vision of the U.K. payments infrastructure for the next five to ten years and the initial work plan for the next three years.

In Australia, the Reserve Bank of Australia published *Strategic Review of Innovation in the Payments System: Conclusions* in 2012. The paper sets out strategic initiatives for the next five to ten years, including real-time processing of credit transfers, availability of payment systems out of normal banking hours, the ability to transmit additional remittance data with payments, and addressing payments using information other than account numbers.

Furthermore, similar discussions have also started in the United States. In September 2013, the Federal Reserve Banks launched a public consultation to seek views on how the U.S. payment system can be improved to better meet the needs of end-users including businesses and individuals. The public consultation paper sets out the view that it is desirable to develop payment services that deliver faster processing and enhanced efficiency using new technology while maintaining the safety and accessibility that existing payments methods have achieved.

II. Enhancement of the Framework for Improving Safety and Efficiency

A. Updating of the Bank's Oversight Policy

The Bank, as is the case with central banks of other major countries, oversees financial market infrastructures (FMIs) from the viewpoint of ensuring the safety and efficiency of the overall FMIs in Japan. Central bank oversight of FMIs is defined as central bank activities to monitor the design, risk management, and operations of individual FMIs, to assess their safety and efficiency, and to induce improvements where necessary.

With the aim of better clarifying its oversight objectives and policy, the Bank updated the paper published in 2002[9] and released *Policy on Oversight of Payment and Settlement Systems* and *Policy on Oversight of Offshore Yen Payment Systems* in May 2010. In response to the publication of the *Principles for Financial Market Infrastructures* (the PFMIs) by the Committee on Payment and Settlement Systems of the Bank for International Settlements (CPSS) and the Technical Committee of the International Organization of Securities Commissions (IOSCO) in April 2012, which expect central banks, market regulators, and other relevant authorities to adopt the standard, the Bank further updated its oversight policy and released *The Bank of Japan Policy on Oversight of Financial Market Infrastructures* in March 2013, after taking into consideration the views of FMI operators and other relevant parties. The updated policy has been in effect since April 2013.

The oversight policy explicitly states that the Bank uses the PFMIs as the standards for the assessment of safety and efficiency of systemically important FMIs and updated the previous policy in line with the PFMIs. Specifically, it identifies the following seven risks as key risks: systemic risk, legal risk, credit risk, liquidity risk, general business risk, custody and investment risks, and operational risk. In line with the characteristics of FMIs, the Bank monitors, analyzes, and assesses how FMIs are exposed to these risks and how they manage them, and induces improvement where necessary.

[9] See Bank of Japan, *The Role of the Bank of Japan in Payment and Settlement Systems*, September 2002.

The oversight policy clearly states with respect to the process of its oversight that i) the Bank utilizes information obtained in the course of its provision of current account services and other business operations, as well as information obtained in the Bank's on-site examinations, which are conducted for the proper execution of such service provision; and ii) the Bank's oversight places particular focus on systemically important FMIs that could have serious impact on the smooth settlement of funds among banks and other financial institutions, which the Bank is mandated to ensure as one of its objectives. With regard to the Bank's oversight of FMIs located outside Japan, the oversight policy prior to the 2013 update covered offshore yen payment systems. In the updated policy the Bank has broadened the scope of its oversight to cover both FMIs for yen payments and those for yen-denominated financial products that are located outside Japan, given *inter alia* that the PFMIs have introduced a principle that encourage cooperation of relevant authorities across jurisdictions and that the Bank has joined a cooperative arrangement for the oversight of an off-shore central counterparty (CCP).[10]

[10] The *Policy on Oversight of Offshore Yen Payment System* released in 2010 was established for the oversight of offshore yen payment systems. It was integrated into the updated oversight policy released in March 2013.

III. Initiatives on Payment and Settlement Systems

A. Initiatives by Private-Sector Financial Market Infrastructures

1. Overview

In light of the publication of the PFMIs and the *Principles for financial market infrastructures: Disclosure framework and Assessment methodology* in 2012, which replaced the previous international standards, private-sector FMIs in Japan have reviewed their operations and risk management frameworks, and have taken initiatives to adopt measures for improvements where necessary.

In addition, in line with the reforms in the over-the-counter (OTC) derivatives market, JSCC launched clearing services for credit default swap (CDS) transactions in July 2011 and interest rate swap (IRS) transactions in October 2012. DTCC Data Repository Japan (DDRJ) was established in April 2012 as a trade depository for OTC derivatives and started reporting to the Financial Services Agency (FSA) in April 2013.

There have also been integration and merger among CCPs. In January 2013, Tokyo Stock Exchange Group and Osaka Securities Exchange (OSE) were merged to form Japan Exchange Group and in July, the clearing functionality of OSE-listed derivatives was integrated from OSE to JSCC. JSCC, in turn, merged with JGBCC on October 1, 2013, to augment market convenience, efficiency, and safety by further enhancing the quality of clearing operations through improved operational efficiency and systems interfaces.

As stated earlier, in March 2013, the Bank released *The Bank of Japan Policy on Oversight of Financial Market Infrastructures*. In line with this policy statement, the Bank has exchanged views with private-sector FMIs in Japan and overseas infrastructures which provide payment and clearing services for yen payments and yen-denominated financial products, with the aim of further improving their safety and efficiency.

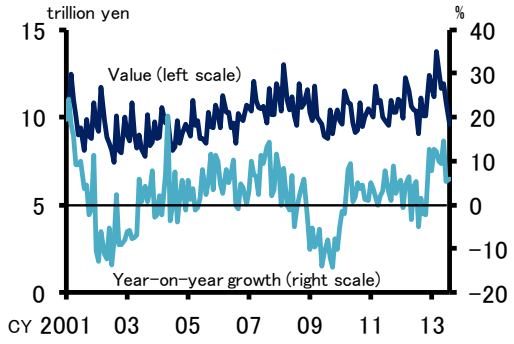
The next section describes the recent developments and ongoing risk management initiatives for the major private-sector FMIs.[11]

2. Initiatives by individual financial market infrastructures

a. Japanese Banks' Payment Clearing Network (Zengin-Net)

Zengin-Net operates the Domestic Fund Transfer System (DFTS), an interbank clearing system for exchanging credit transfer requests[12] between financial institutions and calculating net positions based on those transfer requests. In fiscal 2012, the Zengin Data Telecommunication System (Zengin System), which is the core processing system of the DFTS, processed, on average, about 11 trillion yen per business day (Chart III-1).

Chart III-1 Average Daily Value of Transactions Processed by the Zengin System



Source: Bank of Japan, *Payment and Settlement Statistics*.

In November 2011, Zengin-Net upgraded the Zengin System. This has made the system more flexible and has allowed the system to support internationally accepted standards, for example, Extensible Markup Language (XML) message formats that are compatible with the

[11] As stated in Chapter II, since April 2013, the Bank has used international standards (the PFMIs and the *Principles for financial market infrastructures: Disclosure framework and Assessment methodology*) as the benchmark for oversight for systemically important FMIs, evaluates whether the FMI meets the requirements set out in the international standards, and makes its own assessment. However, the Bank does not intend to publish the results of the assessment of individual private-sector FMIs at this stage.

[12] A bank which has been requested by its customer to make a credit transfer sends a transfer request to a bank with which the receiver of the funds has an account.

ISO20022 standards. In addition, with the implementation of Phase 2 of the RTGS-XG project of the BOJ-NET (see Section B, 1. a. of this chapter), which took place simultaneously with the upgrade of the Zengin System, large-value payments (defined as payments equal to or larger than 100 million yen) in the Zengin System are settled on an RTGS basis in the BOJ-NET, while small-value payments (defined as payments smaller than 100 million yen) continue to be settled on a DNS basis.

For small-value payments, the receiving bank which receives a transfer request from the sending bank credits the funds on the receiver's account on behalf of the sending bank, thus creating an obligation to pay by the sending bank to the receiving bank. Zengin-Net, acting as a CCP, assumes these payment obligations from clearing participants throughout the day of settlement,[13] and these obligations are then netted out at the time of settlement—which is normally 16:15—by offsetting the value of existing credits and debits for each participant. Each participant's net position is settled using current accounts at the Bank held by Zengin-Net and its participants. In fiscal 2012, the average daily value of small-value Zengin System payments was 3.1 trillion yen. The average daily value of payments settled after netting out all participants' positions was 0.7 trillion yen, indicating that about 80 percent of total credits and debits were offset by netting.

DNS entails the risk that unsettled positions will accumulate until the net obligations are settled. To address such risk, Zengin-Net sets a cap on the net debit position of each participant (sender net debit cap) to control the exposure of Zengin-Net to a net sender, and does not assume debt obligations beyond the cap. Further, to mitigate credit risk, Zengin-Net requires each participant to submit, *ex ante*, collateral whose value covers the full amount of their cap.[14] Zengin-Net has also obtained committed lines of credit to address liquidity risk, which ensures timely completion of settlements in the event of inability to pay or delay in payment by the two participants with the largest net debit caps. Furthermore, following the migration of large-value Zengin System payments to RTGS in Phase 2 of the RTGS-XG project, Zengin-Net has been enhancing further its business continuity

[13] For transfer requests that are sent before the value date, obligations are assumed upon the opening of the Zengin System on the value date. For transfer requests that are sent on the value date, obligations are assumed as they arise.

[14] Taking into account the clearing activity after the implementation of Phase 2 of the RTGS-XG project, in December 2012, the Zengin-Net reduced the upper limit for the sender net debit cap.

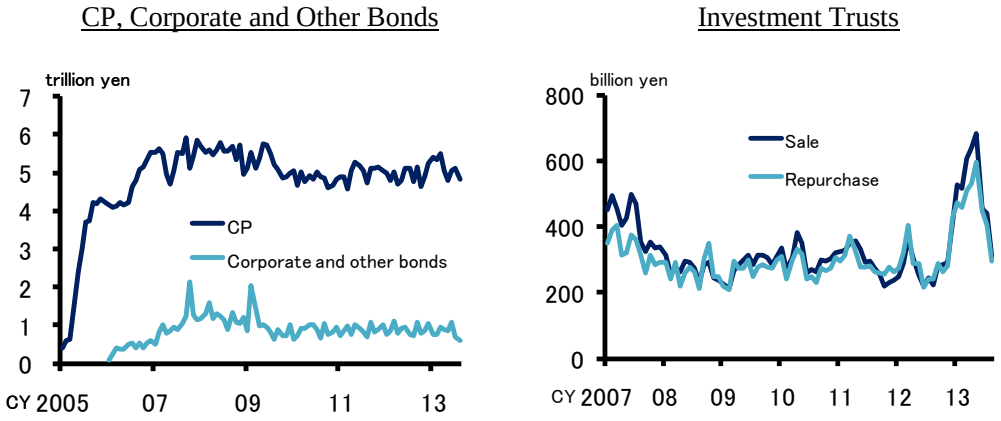
arrangements, for example, by carrying out exercises against various operational disruption scenarios.

On peak days, the Zengin System processes more than 20 million small-value payments and more than 50,000 large-value payments. It is important for Zengin-Net to put in place a framework for maintaining stable operation of the Zengin System, including securing sufficient processing capability envisaging future increases in the volume of payments.

b. Japan Securities Depository Center (JASDEC)

JASDEC is a central securities depository which operates a book-entry transfer system for settling stocks, CP, corporate and other bonds, investment trusts, foreign stocks, and other securities. It also provides pre-settlement matching services for JGB and other securities transactions executed between institutional investors and securities traders. The settlement value of corporate and other bonds and of CP transactions has remained more or less at the same level, but the value of sales and repurchases of investment trusts reached a record level in 2013 (Chart III-2).

Chart III-2 Average Daily Value of CP, Corporate and Other Bonds, and Investment Trusts Processed by JASDEC



Source: Bank of Japan, *Payment and Settlement Statistics*.

JASDEC is scheduled to replace its IT platform in January 2014. The new system will have enhanced system architecture. Moreover, in order to support internationally accepted

standards and reduce the costs of cross-border transactions, it will adopt messages in XML format based on ISO20022 standards and enable connectivity to its system via SWIFTNet. Further, given that some stock lending transactions that were not settled on a DVP basis were exposed to settlement risk at the time of the failure of Lehman Brothers Japan in 2008, JASDEC, jointly with JASDEC DVP Clearing Corporation (JDCC), plans to introduce a risk reduction measure for stock lending transactions, i.e., the introduction of DVP settlement for stock lending transactions. (For details, see 2. e. in this section.)

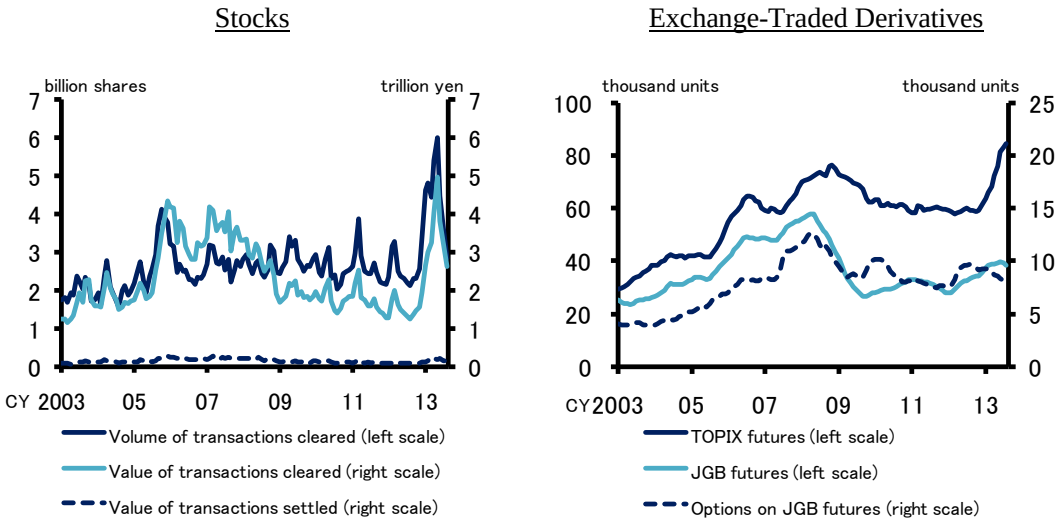
JASDEC is not exposed to credit risk or liquidity risk, even in the event of a participant's default, because it does not assume obligations from its participants (i.e., it does not extend credit or guarantee the execution of settlements). Nevertheless, because its book-entry system is an important infrastructure closely linked to the BOJ-NET and other FMIs in Japan, it is essential that JASDEC adequately controls its operational risks such as assuring a smooth switchover to the new IT platform and managing system disruptions or failures.

c. Japan Securities Clearing Corporation (JSCC)

Since it started operations in 2003, JSCC has provided clearing services for transactions in stocks and other securities (including their lending transactions) traded on stock exchanges across Japan, as well as for derivatives traded on Tokyo Stock Exchange (TSE). JSCC launched clearing services for CDS in July 2011 and for IRS in October 2012, in response to the global OTC derivatives market reforms, which promoted the use of CCPs for these transactions.

The value and volume of stock transactions cleared by JSCC hit records highs in 2013, partly due to the rise in stock prices since the end of 2012. The transaction volume of exchange-traded derivatives cleared by JSCC, such as TOPIX futures, JGB futures, and JGB futures options, have recently trended upward as well (Chart III-3).

Chart III-3　Average Daily Value and Volume of Stocks and Exchange-Traded Derivatives Transactions Processed by JSCC



Note: Figures for "Exchange-Traded Derivatives" are daily averages for the previous 12 months.
Sources: Bank of Japan, *Payment and Settlement Statistics*; Tokyo Stock Exchange.

In December 2012, JSCC introduced a rule for intraday collection of initial margin[15] for its stock clearing service. This rule enables JSCC to collect intraday initial margin under certain circumstances, for example when there is excessive fluctuation in stock prices during the morning session. Such a rule is required in the PFMIs[16] and is aimed at enhancing the safety of settlement by flexibly securing a sufficient amount of financial resources to cover potential losses in the event of sharp price fluctuations.

In addition, with the integration of the clearing functionality of OSE-listed derivatives into JSCC in July 2013, JSCC reviewed the financial resources for covering losses and the default waterfall for these services. The review aimed to enhance the robustness of the clearing arrangement and has resulted in changes in the model used for calculating initial margin and clearing fund contributions,[17] both of which are part of the financial resources for covering

[15] For the term "initial margin" in the PFMIs, JSCC uses "clearing funds for securities contracts" or "collateral" in relation to its stock clearing service.

[16] The PFMIs stipulate that "a CCP should have the authority and operational capacity to make intraday margin calls and payments, both scheduled and unscheduled, to participants." (Principle 6. Key considerations 4)

[17] For the term "initial margin" in the PFMIs, JSCC uses "margin" in relation to its exchange-traded derivatives clearing service.

losses.[18] At the same time, the role of the clearing fund as a prefunded, mutualized loss sharing arrangement was clarified (Chart III-4).[19]

For OTC derivatives clearing services, there are ten clearing participants and two clearing customers for the CDS service. The open interest of assumption of obligations as of the end of September 2013 stood at 570.5 billion yen. For the IRS service, there are 21 clearing participants and eleven clearing customers[20] and the open interest as of the end of September 2013 stood at 443 trillion yen (Chart III-5). This makes JSCC the second largest CCP in the world after LCH.Clearnet Group (2,637 trillion yen) in the clearing of yen-denominated IRS, and third after LCH.Clearnet Group (421 trillion U.S. dollar) and CME Group (6.4 trillion U.S. dollar) for IRS in all currencies.

JSCC expects the number of clearing participants to increase with the introduction of client clearing and plans to expand the scope of products cleared. At the same time, with a view to expanding its operations internationally, it has filed applications for recognition as a third-country CCP in the European Union (EU), and is preparing for registration as a Derivatives Clearing Organization (DCO) with the U.S. Commodity Futures Trading Commission (CFTC) for its IRS service. It is important for JSCC to further enhance its operations and system platform in line with the expansion of its clearing services.

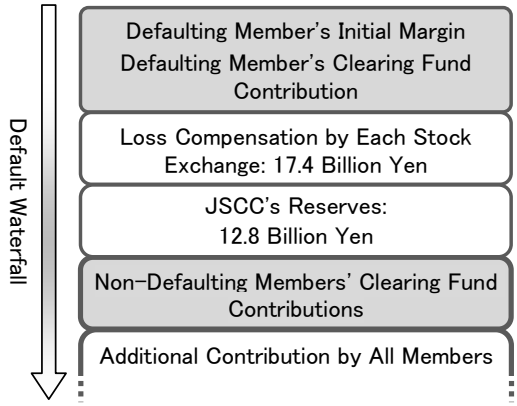
---

[18] For calculating the initial margin requirement, JSCC uses Standard Portfolio Analysis of Risk (SPAN). Following the review, the new method for calculating SPAN risk parameters (price scan range) uses the volatility index or its implied volatility for the cleared product (for Nikkei Average futures, TOPIX futures, and JGB futures). The scenario for calculating clearing fund contributions include; i) the combined default of the participant that would potentially cause the largest loss and the five smallest participants in terms of net asset value; and ii) 99 percent expected shortfall under t-distribution for the rate of market volatility (the rate of price movement in underlying assets).

[19] The required amount of the clearing fund is calculated separately for the clearing of JGB futures, index futures, and OSE-FX, with each clearing fund used only to cover the loss that arises from each product.

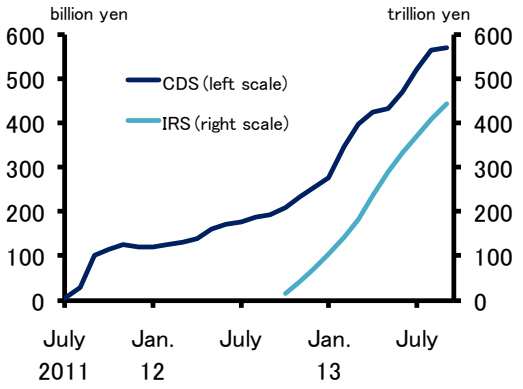
[20] Currently, the scope of clearing customers is limited to entities in the same corporate group of the clearing participants. However, JSCC plans to expand the scope of clearing customers on February 24, 2014 to include entities outside of clearing participants' corporate group.

Chart III-4　JSCC's Loss Sharing Arrangement for Exchange-Traded Derivatives



Source: Japan Securities Clearing Corporation.

Chart III-5　Open Interest of Assumption of Obligations for OTC Derivatives by JSCC



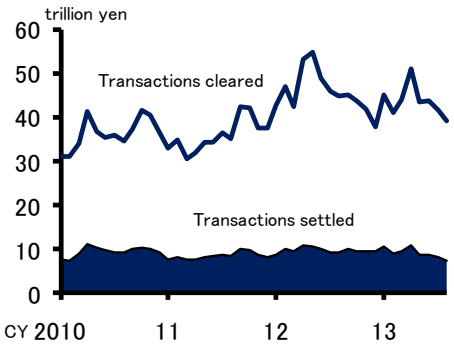
Source: Japan Securities Clearing Corporation.

d. Former[(note)] Japan Government Bond Clearing Corporation (JGBCC)

(Note) As stated above, JGBCC merged with JSCC on October 1, 2013.

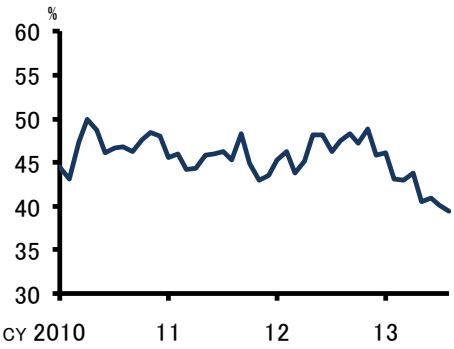
JGBCC provides clearing services for OTC trades in JGBs, i.e., outright trades and repo trades (either in the form of securities lending with cash collateral or sales with repurchase agreements). The average daily value of settlement obligations accepted and cleared by JGBCC came close to its historical high (55.3 trillion yen recorded in April 2008) at 54.9 trillion yen in May 2012, supported by the increase in JGB trades stemming from intensifying investor stance on seeking safe assets against the backdrop of the European debt problem. It then decreased a little and recently has stayed around 40 trillion yen (Chart III-6). JGB transactions settled via JGBCC as a share of overall DVP-settled transactions recently accounted for about 40 percent (Chart III-7).

Chart III-6 Average Daily Value of Transactions Processed by JGBCC



Source: Bank of Japan, *Payment and Settlement Statistics*.

Chart III-7 Share of JGBCC in DVP-Settled Transactions



Source: Bank of Japan, *Payment and Settlement Statistics*.

JGBCC's daily settlement value through its current account with the Bank is the largest among CCPs in Japan. This reflects the enormous size of JGB transactions, as well as the clearing method of JGB transactions that requires settlement of the principal value after netting based on each JGB issue.

JGBCC is also working to expand its participant base in order to improve efficiency and reduce settlement risk in JGB transactions. Trust banks, which are major players in the JGB market, are scheduled to become clearing participants by mid-2014. JGBCC is undertaking measures to build processes and systems that take into account the characteristics of these banks.[21]

Meanwhile, JGBCC is considering various measures to enhance its functions as a CCP based on the lessons learned from the failure of Lehman Brothers Japan and the implementation of the PFMIs, with recognition that it is important for JGBCC to secure a sufficient amount of financial and liquidity resources in light of the high value it clears and to further enhance its capacity to deal with a default of a participant.

[21] The Japan Securities Dealers Association (JSDA), JGBCC, and the Trust Companies Association of Japan jointly released in June 2010 a roadmap that clarified the deadlines for implementing efforts aimed at reducing settlement risk for JGB transactions. An updated version of the roadmap was released in June 2013.

With respect to credit risk management, JGBCC has been discussing with participants the enhancement of financial resources to cover losses in the event of a participant's default, aiming at arriving at a conclusion before the end of 2013. It has also reviewed the calculation model of initial margin requirements to comply with the requirements under the European Market Infrastructure Regulation (EMIR). In September 2013, it filed an application for recognition as a third-country CCP in the EU.

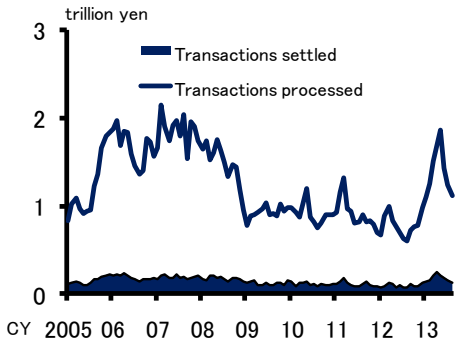
As for liquidity risk management, JGBCC started discussion with its participants in July 2012 on the calculation method of the liquidity requirement and the funding arrangement in preparation for a default of the clearing participant and its affiliates that would generate the largest aggregate payment obligation.

The challenge for JGBCC is to steadily implement the outcomes of these discussions to enhance its risk management arrangements in line with the growth in the value of transactions.

e. JASDEC DVP Clearing Corporation (JDCC)

JDCC, a wholly owned subsidiary of JASDEC, provides clearing services for stocks and other securities that are traded off-exchange between financial institutions. In fiscal 2012, the average daily value of transactions cleared by JDCC was 876.2 billion yen, and that of payment obligations settled was 111.3 billion yen, more or less unchanged from the levels of the previous year. However, since the end of 2012, owing to positive stock market activity resulting from stock price rises, etc., these values had surged and stayed at a relatively high level (Chart III-8).

Chart III-8　Average Daily Value of Transactions Processed by JDCC



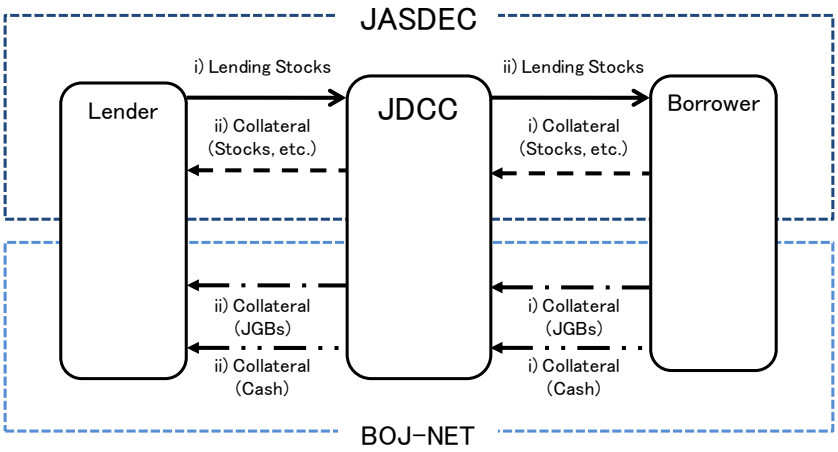
Source: Bank of Japan, *Payment and Settlement Statistics*.

For stocks and other securities transactions, JDCC assumes obligations to deliver securities and make payments on the day of settlement. It also provides a mechanism to reduce principal risk in securities settlement and to guarantee payments of funds. On the other hand, there is no CCP offering such services for stock lending transactions.[22] As a result, at the time of the failure of the Lehman Brothers Japan in 2008, some parties which had engaged in stock lending transactions with Lehman Brothers Japan failed to receive the collateral (cash) equivalent of the stocks they had delivered. Against this backdrop, JASDEC and JDCC held discussions with major participants in the stock lending market on the measures to reduce settlement risk in stock lending transactions.[23] As a result, they decided to introduce a clearing and settlement scheme that reduces the principal risk in stock lending transactions (hereafter referred to as the "DVP settlement scheme for stock lending transactions"), by adding some functionality to the JDCC's existing DVP settlement scheme (Chart III-9).

[22] Excluding stock and other securities loan transactions via securities finance companies.

[23] *Development of Institutional Frameworks Pertaining to Financial and Capital Markets* released by the Financial Services Agency in 2010 pointed to the need of urgently working on the enhancement of the securities settlement and clearing frameworks for stock lending transactions.

Chart III-9　DVP Settlement Scheme for Stock Lending Transactions



i) JDCC accepts the lending stocks from the lender participant and assumes obligations related to the stock lending transaction, within the amount of the collateral pledged to JDCC by the borrower participant. JDCC also assumes obligations related to the collateral transaction from the borrower participant. The delivery of the lending stocks and the collateral (stocks, etc. and/or JGBs) to JDCC is processed by 13:30. The amount of cash collateral to be delivered to JDCC is calculated by netting with the cash-leg of DVP settlement for outright transactions of stocks, and is paid to JDCC by 15:10.

ii) JDCC confirms that the borrower participant has pledged sufficient collateral or paid a cash amount after netting, and then delivers the lending stocks to the borrower participant. Similarly, JDCC delivers the collateral (stocks, etc. and/or JGBs) to the lender participant of the stock lending transaction.

Under the DVP settlement scheme for stock lending transactions, as in the case of JDCC's existing DVP settlement scheme, JDCC as a CCP will interpose itself between the parties to the transaction and assume obligations to deliver the securities and collateral from its participants on the day of settlement. For these obligations, JDCC conducts net settlement for the cash-leg and gross settlement for the securities-leg. In calculating cash positions, JDCC nets each participant's cash position arising from stock lending transactions with those from stock outright transactions. Stocks and other JASDEC-eligible securities are settled by the JASDEC's book-entry transfer system, while the BOJ-NET is used for settlement of funds and JGBs.

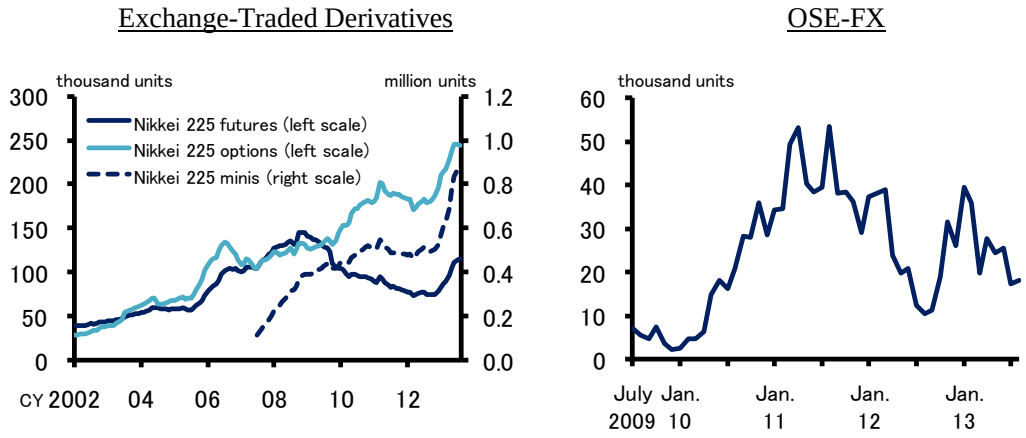
The DVP settlement scheme for stock lending transactions is scheduled to start operations in January 2014, together with the replacement of JASDEC's IT platform. The management of the system development project for the new scheme is therefore of great importance.

f. Osaka Securities Exchange (OSE)

OSE provides services for listing and clearing of exchange-traded derivatives, such as equity-based derivatives and FX margin contracts (OSE-FX). As stated above, the clearing functionality of OSE-listed derivatives and FX margin contracts was integrated into JSCC in July 2013.[24]

The average daily volumes cleared by OSE for Nikkei 225 options and Nikkei 225 minis (small-sized contracts in futures) continued to increase in 2012 mainly due to the extension of trading hours.[25] Volumes for Nikkei 225 futures and OSE-FX transactions have also picked up, supported by rising stock prices and the depreciation of the yen since the end of 2012 (Chart III-10).

Chart III-10 Average Daily Volume of Transactions Processed by OSE



Notes: 1. Figures for "Exchange-Traded Derivatives" are daily averages for the previous 12 months.
2. Figures for "OSE-FX" are daily averages for the total of all currencies.
Source: Osaka Securities Exchange.

g. Tokyo Financial Exchange (TFX)

TFX lists financial derivatives, such as interest rate futures/options, FX margin contracts, and equity index margin contracts, and provides clearing services for these products.

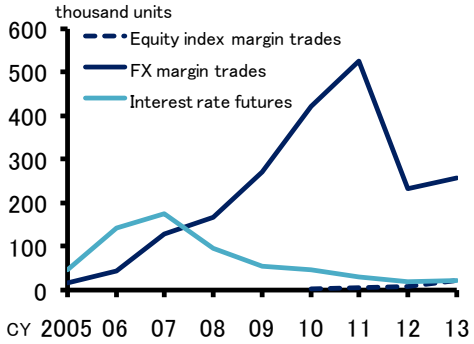
---

[24] Stock trading has been transferred from OSE to TSE in July 2013. Clearing service for stocks traded on OSE has been provided by JSCC since 2003.

[25] In July 2011, OSE extended the closing hour of the night session for exchange-traded derivatives from 23:30 to 3:00 on the following day.

Trading volumes for interest rate futures/options have declined with a prolonged period of low-interest environment. The volumes for FX margin contracts dropped sharply reflecting the termination of tax benefits for exchange-traded transactions in January 2012, but have recovered in recent months. Equity index margin contracts have increased moderately since their listing in November 2010 (Chart III-11).

Chart III-11 Average Daily Trading Volume on TFX



Note: Figures for 2013 are for the 8 months ending August 2013.
Source: Tokyo Financial Exchange.

In order to comply with the PFMIs, TFX has been reviewing its financial and liquidity resources for addressing credit and liquidity risks. Specifically, for each of the above-mentioned three products, TFX is considering a framework whereby it identifies stress scenarios in line with the PFMIs and ensures it has sufficient financial and liquidity resources that cover the loss and liquidity shortfalls calculated by the stress tests. In addition, it filed an application for recognition as a third-country CCP in the EU in September 2013.

TFX has scheduled system replacements for the interest rate futures trading system in February 2014 and for the margin contract trading system in October 2013. As well as enhancing accessibility, these replacements are expected to improve resilience against operational risks by allowing instantaneous switchover to the back-up system in the event of system disruptions or failures and by establishing a new back-up system for margin contract trading. TFX is expected to implement the changes steadily as these system replacements are important for improving the functions of TFX.

h. DTCC Data Repository Japan (DDRJ)

DDRJ was established in April 2012 as a subsidiary of Deriv/SERV[26] within the Depository Trust and Clearing Corporation (DTCC) Group.

In Japan, it has become mandatory since April 2013 for the financial institutions to store information with respect to certain OTC derivatives transactions and report it to the FSA. Transaction data are to be reported either directly to the FSA or via an FSA-designated trade repository in cases where the transaction is not cleared by CCPs, while a CCP will report them to the FSA in cases where the transaction is cleared by CCPs.

DDRJ is the only trade repository in Japan that has been designated by the FSA. As of September 2013, 34 financial institutions have used its service. In order for DDRJ to provide timely and accurate data to the relevant authorities and participants, and thereby contribute to further increasing the transparency of the market, it is expected that DDRJ will further improve the stability and efficiency of its information system.

i. Financial market infrastructures and critical service providers located abroad

This section describes the recent developments of the offshore FMIs and a critical service provider for which there are international cooperative oversight arrangements that the Bank participates in.[27]

(1) CLS

CLS is a cross-border payment system for FX transactions for the major currencies, and is operated by CLS Bank International headquartered in New York. CLS offers a PVP settlement mechanism and assumes a pivotal role in reducing settlement risks associated

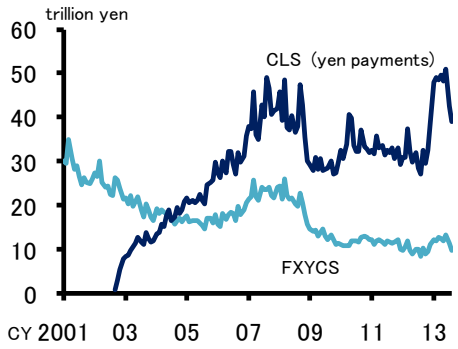
[26] Deriv/SERV currently has data centers in the United States, Europe, and Singapore.

[27] In addition to the international cooperative oversight arrangements for the two FMIs and a critical service provider described in this section, a framework for cooperative oversight on Euroclear Bank, an international central securities depository located in Belgium, was newly established in July 2013 by the National Bank of Belgium and the Bank.

with FX transactions.[28] The central banks whose currencies are settled in CLS including the Bank have established a cooperative oversight arrangement for CLS and have been conducting various oversight activities against CLS, led by the Federal Reserve System as the lead overseer.

Yen payments arising from FX transactions are processed by CLS and FXYCS. While the value of yen payments settled by CLS had remained at about the same level as it was in the previous year for most of 2012, it has significantly increased since the end of 2012, reflecting a large increase in FX market activity (Chart III-12). In comparison, the growth in values settled by FXYCS has remained small, further increasing the share of FX transactions settled by CLS.

Chart III-12 Average Daily Value of Yen Payments Processed by CLS and FXYCS



Source: CLS; Bank of Japan, *Payment and Settlement Statistics*.

CLS has enhanced its risk management and business continuity management to ensure the stable performance of its operation. For instance, CLS has secured fully redundant operational infrastructures both in New York and London. As a result, when it became temporarily difficult for CLS to operate in New York due to Hurricane Sandy which hit the U.S. East Coast in October 2012, CLS was able to continue to provide its settlement service without disruption by immediately switching its core FX service from New York to London.

[28] In July 2012, the U.S. Department of the Treasury's Financial Stability Oversight Council designated CLS as a systemically important financial market utility (SIFMU) under Title VIII of the Dodd-Frank Wall Street Reform and Consumer Protection Act.

Also, in recent years, CLS has been engaged in various strategic initiatives with the aim of expanding the coverage of its PVP settlement service and thereby further reducing risks associated with FX transactions. Such initiatives include:

i) Expanding the number of CLS-eligible currencies beyond the currently eligible 17 currencies. Prospective currencies include those in Asia and emerging countries, such as Brazilian real, Chilean peso, Chinese yuan, Russian ruble, and Thai baht.

ii) Developing separate sessions for same-day FX transactions which had generally been settled outside CLS. As the first of such sessions, CLS introduced in September 2013 a new settlement session for same-day U.S. dollar-Canadian dollar transactions, in light of the overlapping time zones and the relatively large trading volume of the currency pair. CLS plans to consider providing same-day settlement services for currencies in other regions in the future.

When introducing these new services, it is critical for CLS to ensure that robust IT infrastructures are in place and its risk management framework properly addresses potential risks associated with the new services, including their implications on liquidity risk management. For instance, from a liquidity risk management perspective, CLS is a highly tiered payment system in which a significantly large number of indirect participants settle through a relatively small number of direct participants.[29] Under such a high degree of tiering, a pay-in failure of one major direct member could have a crippling impact on the liquidity needs of CLS and its participants as a whole. Therefore, securing sufficient amount of liquidity resources to ensure smooth completion of settlement and addressing the concentration risk of settlement through a limited number of participants continue to be important issues for CLS.

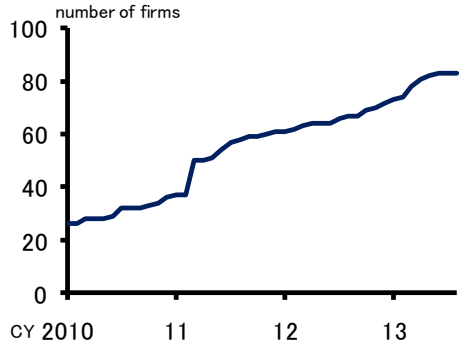
[29] As of December 2012, CLS had: i) 62 "Settlement Members", CLS members who can submit payment instructions directly to CLS and have an account with CLS for settlement processing; ii) 2 "User Members", CLS members who can submit payment instructions directly to CLS but do not have an account with CLS and must instead be sponsored by a designated Settlement Member for settlement processing; and iii) 13,877 "Third Parties", CLS participants other than Settlement Members and User Members. In addition, in making payments to CLS in currencies other than their home currency, most Settlement Members rely on "Nostro Agents", which are typically major financial institutions in the respective jurisdictions.

Furthermore, as an increasing number of jurisdictions have been implementing requirements mandating the use of CCPs for market participants in the OTC derivatives market, it is becoming important for CLS to consider how to respond to new environments, including how it will position itself in relation to CCPs which clear FX derivatives.

(2) LCH SwapClear

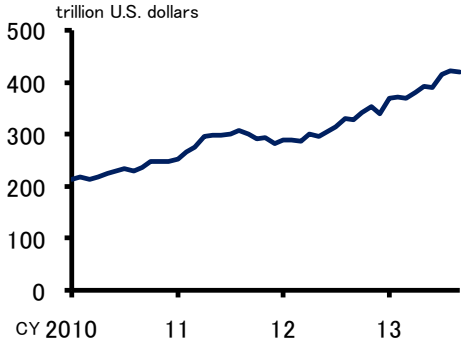
LCH.Clearnet Ltd. (LCH) is a U.K.-based CCP that provides clearing services (SwapClear) for OTC IRS in 17 currencies including the yen. In light of the reforms in the OTC derivatives market based on the commitments of the G20 leaders at the Pittsburgh 2009 Summit, the number of clearing members and the notional amounts outstanding in SwapClear have been increasing in recent years (Chart III-13). The amounts reached 421 trillion U.S. dollars at the end of September 2013 (Chart III-14). The notional amounts outstanding of yen-denominated trades stood at 2,637 trillion yen, which accounted for around 6 percent of the total of all currencies.

Chart III-13 Number of Members in LCH SwapClear



Source: LCH.Clearnet Group.

Chart III-14 Notional Amounts Outstanding in LCH SwapClear



Source: LCH.Clearnet Group.

In the OTC derivatives market reforms, establishment of international arrangements for supervision and oversight of global CCPs has been identified as one of the priority issues in achieving mandatory clearing. In 2012, the supervisory authorities and central banks of major jurisdictions including the Bank established an international cooperative oversight arrangement for SwapClear.

As work continues toward full implementation of mandatory clearing obligations, the requirements for risk management of CCPs have been strengthened in accordance with the PFMIs. LCH is expected to improve its governance framework and its management of credit and liquidity risks in the light of these standards. The authorities will also examine the operational and regulatory implications for SwapClear services from the recent changes, such as the acquisition of LCH.Clearnet Group by London Stock Exchange Group and the establishment of the U.S.-based entity, LCH.Clearnet LLC.

(3) SWIFT

SWIFT provides international messaging services for financial transactions to financial institutions and other entities. With a view to securing appropriate governance and improving risk management, central banks of the Group-of-Ten (G10) countries, including the Bank, have been cooperating internationally in the oversight of SWIFT.[30] In light of the growing use of SWIFT services in emerging economies in recent years, the SWIFT Oversight Forum was established in 2012 as a framework to share information on SWIFT oversight activities among G10 and ten other central banks.

Since 2007, in order to improve its resilience and strengthen its contingency planning, SWIFT has been conducting a project to rebuild its operating centers. It started operations at a new fully state-of-the art operating center in Switzerland in mid-2013.

In July 2012, SWIFT experienced a half-hour service outage. It had no impact on payment and settlement systems in Japan partly because the incident occurred in the middle of the night in Japan. Customer impact globally was also limited. SWIFT has been further strengthening its risk management to prevent recurrence of similar incidents.

In addition to strengthening the operational management as mentioned above, it is important for SWIFT, as a provider of international messaging services for financial transactions, to continue to enhance its cyber-security management in a proper and steady

[30] While SWIFT is not an FMI under the definition in the international standards, a problem in the operation or other aspects of SWIFT could have a significant impact globally. As such, a framework for international cooperative oversight has been developed.

manner against the background of growing sophistication and complexity of cyber-attacks in recent years.

B. Actions Taken by the Bank

1. Improvement of the BOJ-NET

The Bank operates the BOJ-NET. The BOJ-NET Funds Transfer System processes funds transfers through current accounts that financial institutions hold with the Bank and is used for the settlement of money market transactions, the cash legs of JGBs transactions, as well as the settlement of the net positions arising from private-sector payment and settlement systems, including the Zengin System, bill and check clearing systems, and FXYCS. The BOJ-NET JGB Services processes online the transfer of securities among financial institutions which have JGB accounts at the Bank and is used for outright purchase and lending of JGBs and posting of JGBs as collateral. It also processes auctions, issuances, and payments associated with the issuance of JGB.

The following sections discuss the effect of the project to improve the RTGS functionality in the BOJ-NET (the RTGS-XG project), which was completed in November 2011, and the objectives of building a new BOJ-NET, which is now underway.

a. The implementation of Phase 2 of the Next-Generation RTGS project

From 2006 through 2011, the Bank carried out the RTGS-XG project of the BOJ-NET Funds Transfer System. The project consisted of two pillars: i) to enhance efficiency in the use of liquidity by introducing liquidity-saving features (LSF)[31] into RTGS processing in the BOJ-NET Funds Transfer System; and ii) to enhance safety by shifting large-value payments that were previously processed by private-sector DNS systems (namely, FXYCS payments and Zengin System payments of 100 million yen or above) to settlement on an RTGS basis in

[31] The LSF in the BOJ-NET consist of centralized queuing and off-setting mechanisms. "Queuing" allows payment instructions to be held in a queue while "off-setting" searches for a set of instructions which can be settled with less liquidity and settles them simultaneously. For details, see *Payment and Settlement Systems Reports* 2009 and 2007-2008.

the BOJ-NET with LSF.[32] In October 2008, the introduction of LSF and the shift of FXYCS payments to RTGS were completed (Phase 1). In November 2011, large-value Zengin System payments, which were yet to be migrated, were shifted to RTGS (Phase 2).[33] With the completion of the RTGS-XG project, all large-value payments in Japan have been shifted to RTGS processing.

A review of the volume and value of payments processed through queuing and offsetting (Q/O) accounts[34] after the implementation of Phase 2 shows that in March 2012, the volume and value of large-value Zengin System payments averaged at about 10,700 transactions and about 9.5 trillion yen per business day. With the addition of these payments to payments for money market transactions and FXYCS payments, the total amount settled on Q/O accounts increased by approximately 30 percent in terms of volume and by about 20 percent in terms of value. On the last business day of the month, on which processing of large-value Zengin System payments are concentrated, the volume and value of transactions for such payments were as high as about 50,900 transactions and about 42.5 trillion yen. As a result, the total amount settled on Q/O accounts increased sharply to 2.1-fold in terms of volume and to 1.8-fold in terms of value (Chart III-15).

[32] Previously, most of the payments in FXYCS and all payments in the Zengin System had been processed on a DNS basis. DNS involves the risk of unwinding payments in the event of failure to pay by the participants, which could become a source of systemic risk to the overall payment system.

[33] Large-value Zengin System payments which were shifted to RTGS processing in Phase 2 accounted for less than 1 percent of total Zengin System payments in terms of volume but represented more than 70 percent of the total in terms of value.

[34] Q/O accounts are accounts newly created in addition to the home accounts to allow for the use of LSF. They process three types of transactions, namely, large-value Zengin System payments, money market transactions (e.g., call loans), and FXYCS payments.

Chart III-15 Volume and Value of Transactions on the Q/O Accounts in March 2012

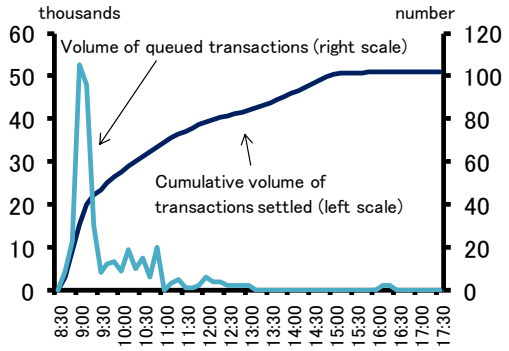
Type of transactions	Daily average			Last business day March, 2012		
	Volume (thousands)	Value (trillion yen)	Value per transaction (100 million yen)	Volume (thousands)	Value (trillion yen)	Value per transaction (100 million yen)
Total	44.5	54.4	12.2	95.2	98.1	10.3
of which:						
Large-value Zengin System payments	10.7	9.5	8.9	50.9	42.5	8.3
Money market transactions	5.7	33.9	59.8	6.6	40.5	61.7
FXYCS payments	28.1	11.0	3.9	37.8	15.1	4.0

Source: Bank of Japan.

An analysis of intraday settlement timing of large-value Zengin System payments on the last business day of March 2012 shows that the number of payments settled increased at a rapid pace between 8:30 and 9:00, a special window opened on the last business day of each month exclusively for large-value Zengin System payments, and then maintained a more or less steady pace until around 15:00. Payments queued due to a liquidity shortage increased temporarily at around 9:00, but it can be seen that the volume of queued payments itself was very small (Chart III-16).

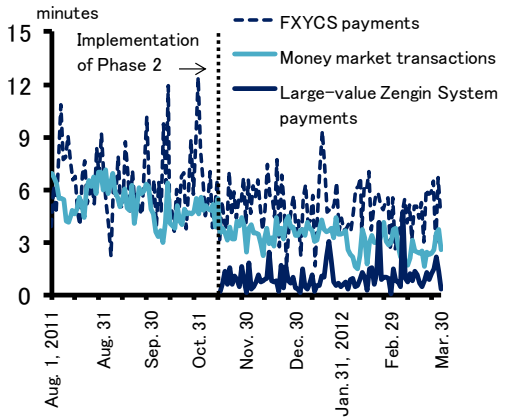
A comparison of average time on the queue by type of payments after the implementation of Phase 2 shows that it was 59 seconds for large-value Zengin System payments, 3 minutes and 12 seconds for money market payments, and 4 minutes and 59 seconds for FXYCS payments. In all cases, they were released from the queue in a relatively short time. For money market payments and FXYCS payments, the average time on the queue was shorter than before the implementation of Phase 2. After the implementation of Phase 2, financial institutions transferred ample liquidity to their Q/O accounts during the high-value time-band, and this is likely to have contributed to this development (Chart III-17).

Chart III-16 Intraday Settlement Timing of Large-Value Zengin System Payments after Phase 2



Note: Figures for March 30, 2012.
Source: Bank of Japan.

Chart III-17 Average Time on Queue before and after Phase 2



Note: Average time on queue is the weighted average using the values of transactions.
Source: Bank of Japan.

b. Establishment of the new BOJ-NET

In order to flexibly adapt to future changes in financial services, such as globalization in financial markets and increasing interdependencies among payment and settlement infrastructures, while reducing as much as possible the costs in the medium to long term, the Bank is now working on establishing a new system (the new BOJ-NET) to replace the existing BOJ-NET.

The new BOJ-NET offers a higher degree of convenience to its users by adopting versatile information processing technologies. For example, it will adopt XML messages for communication messages on its network, while adopting ISO20022 messages for some transactions to support end-to-end straight-through processing. At the same time, in order to improve accessibility by payment and settlement systems and financial institutions at home

and abroad, it will adopt BIC code[35] for identification of financial institutions and their branches in addition to the present code widely used in Japan. It will also adopt ISIN code[36] for identification of JGB issues for the same objective.

In order to respond to the payment and settlement needs during the night and early morning hours, the Bank is establishing a system platform which would allow the operating hours to be extended substantially longer.[37] Payment and settlement needs in such time bands suggested by financial institutions and other interested parties include the same-day settlement of yen-denominated remittances from overseas clients, the utilization of JGBs as collateral in the U.S. or European markets, and cross-border transactions in the yen currency or JGBs.

With respect to the operating hours of the new BOJ-NET, the Bank plans to bring forward the opening hour from 9:00[38] at present to 8:30 (7:30 on the extension days[39]) for both the Funds Transfer System and JGB Services, and to move back the closing hour for JGB Services to 19:00, the same as for the Funds Transfer System. Since August 2013, the Bank has been in discussion with financial institutions and other interested parties through the "Roundtable on the Effective Utilization of the new BOJ-NET" on how the new BOJ-NET can be utilized effectively, as well as the possible operating hours and implementation timeframe in the event that further extensions are made.

---

[35] BIC (Business Identification Code) is an international coding system for identifying financial and non-financial institutions. The International Organization for Standardization (ISO) recognizes it as ISO9362. An 8-character BIC identifies an institution and includes two characters identifying the country (the 5th and 6th characters). An 11-character BIC identifies a branch with an additional three characters.

[36] ISIN (International Securities Identification Number) is an international coding system for identifying various bonds, stocks, futures instruments and other securities. The ISO recognizes it as ISO6166. This 12-character code comprises two characters for identifying the country, nine characters for identifying the security, and one check digit.

[37] The Bank has conducted four rounds of public consultations prior to the publication of the final functional specification of the new BOJ-NET.

[38] On the last business day of each month, the opening hour is brought forward to 8:30 exclusively for large-value Zengin System payments.

[39] The days on which the time for settlement of net positions arising from small-value Zengin System payments is moved back from 16:15 upon prior request from the Zengin-Net.

The development process for the new BOJ-NET is being carried out in two phases to ensure smooth shift to the new system. According to the present plan, in Phase 1, which will be implemented on January 6, 2014, the following operations will be shifted: auctions for money market operations and for the issuance of JGBs, as well as the transfer of JGBs associated with money market operations. In Phase 2, the plan calls for shifting principal operations related to settlement of funds and JGBs to the new system sometime between autumn 2015 and early 2016.

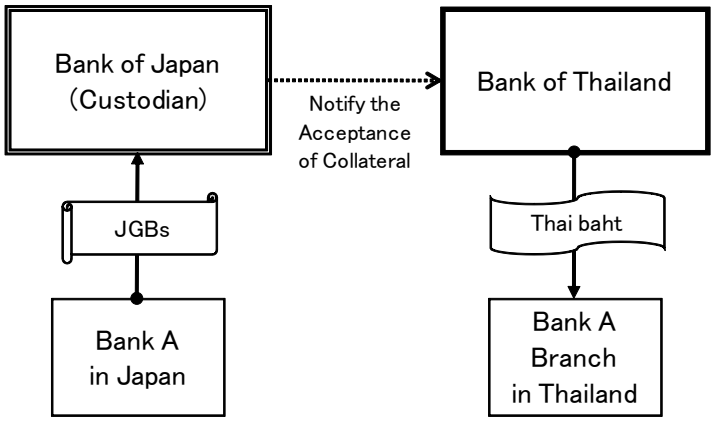
2. Introduction of cross-border collateral arrangements with foreign central banks

The Bank is collaborating closely with other central banks through the CPSS, the Working Group on Payment and Settlement Systems of the Executives' Meeting of East Asia-Pacific Central Banks (EMEAP)[40] and others for the introduction of cross-border collateral arrangements, under which JGBs are to be posted as collateral, in an effort to cooperate in securing financial market stability in the relevant countries (Chart III-18). Under this scheme, foreign central banks accept JGBs as collateral from financial institutions, with the Bank acting as the custodian of the collateral, and provide liquidity in local currency in their home country. This should facilitate funding of non-domestic financial institutions that do not have a stable basis for funding, such as local retail deposits, even when the local financial system becomes destabilized. It should, in turn, allow stable provision of local currency to businesses and local subsidiaries that are customers of the financial institutions.

In October 2011, the Bank reached an agreement with the Bank of Thailand on a scheme for the provision of liquidity in Thai baht by the Bank of Thailand utilizing JGBs as collateral. This scheme became operational in November 2011. In July 2013, the Bank also agreed with the Monetary Authority of Singapore on the establishment of an arrangement for the provision of liquidity in Singapore dollars by the Monetary Authority of Singapore utilizing JGBs as collateral.

[40] As of March 2013, central banks and monetary authorities from eleven economies (Australia, China, Hong Kong, Indonesia, Japan, Korea, Malaysia, New Zealand, Philippines, Singapore, and Thailand) participate in EMEAP.

Chart III-18　Cross-Border Collateral Arrangement with the Bank of Thailand



C. Actions Taken by Market Participants

1. Shortening the JGB settlement cycle

Since the latter half of the 1990s,[41] shortening the JGB settlement cycle has been regarded as one of the major priorities in securities settlement systems reform. A longer time lag between trade and settlement increases the outstanding value of unsettled positions, and hence settlement risk. At the time of the failure of the Lehman Brothers Japan in 2008, in some cases, it took a long time for the firm's counterparties to close out and replace transactions with the firm. There were also large-values of settlement fails. Amid these events, market participants reacknowledged the importance of shortening settlement cycles, which led to the establishment of the Working Group on Shortening of JGB Settlement Cycle (hereafter, "the WG") in September 2009.

The WG sorted out and discussed the challenges in shortening the settlement cycle,[42] and reviewed post-trade processing by standardizing and streamlining some processes. As a result, the JGB settlement cycle was shortened to T+2 for outright transactions (T+1 for

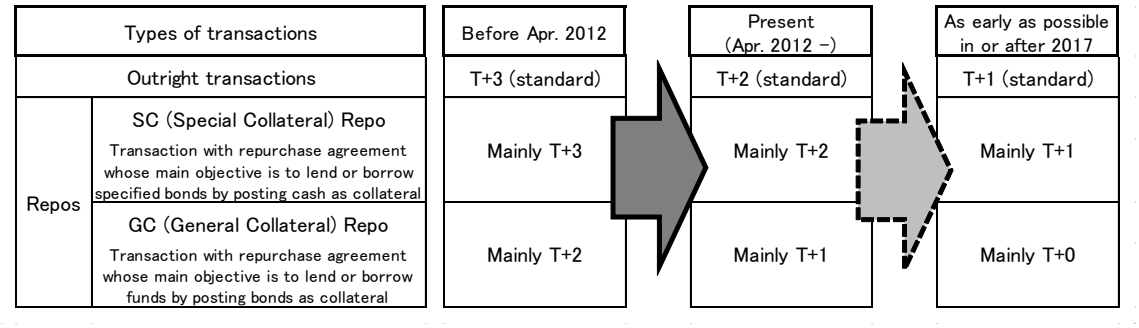
[41] In Japan, the JGB settlement cycle was shortened from settlement on "the 5th, 10th, 15th, 20th, 25th, and 30th of each month" to T+7 (trade date plus seven business days) in 1996 and to T+3 in 1997.

[42] In November 2011, the WG released *Working Group on Shortening of JGB Settlement Cycle Final Report*.

General Collateral (GC) repo transactions)[43] starting with contracts executed on April 23, 2012.

At present, the WG is working for the target of implementing T+1 settlement cycle for outright transactions as early as possible in 2017 or thereafter. In order to achieve this, it is necessary to develop trading schemes and market infrastructures which would allow T+0 settlement of GC repo transactions and to change market practices so that a broad range of market participants would be able to execute T+1 settlement for outright transactions (Chart III-19).

Chart III-19 Present Situation and Future Direction of JGB Settlement Cycle



2. Enhancing business payments

In July 2011, the JBA established a study group on enhancement of business payments with a view to considering how business payments can be enhanced by utilizing payment infrastructures shared by financial institutions. The Bank took part in the discussions through its participation in the study group along with financial institutions. The report released in April 2012 summed up the needs for enhancing payment services to businesses to the following three points: i) linkage between payment information and remittance

[43] Securities companies raise necessary funds after reviewing their inventory securities and cash positions based on outright transactions. As GC repos (transactions with repurchase/securities lending agreement whose main objective is to lend or borrow funds by posting bonds as collateral) are used for this purpose, the settlement cycle for GC repos tends to be one business day shorter than that for outright transactions. On the other hand, the settlement cycle for Special Collateral (SC) repos (transactions with repurchase/securities lending agreement whose main objective is to lend or borrow specified bonds by posting cash as collateral) tends to be the same as that for outright transactions.

information; ii) support for enhancing cash management; and iii) improvement in day-to-day payment processes.

The linkage between payment information and remittance information cited in i) refers to extending the electronic data interchange (EDI) process, which currently starts at the stage of purchase orders and ends at the point just before payments, to cover the payment stage as well. EDI is being increasingly used in various industries, and its extension would further increase the efficiency of corporate activity. Considering this as a priority issue, in July 2012, the banking industry established jointly with the distribution industry[44] a working group on the linkage of payment information and remittance information (with Distribution Systems Research Institute[45] serving as secretariat) to identify specific practical needs and to examine the technologies and institutional frameworks needed to address them. The banking industry and the distribution industry are continuing further discussions in preparation for a joint pilot trial.

In addition, in May 2013, an ad-hoc task force on the improvement of payment and settlement services was set up as an arm of the Public-Private Roundtable which was held based on a report by the Financial System Council's Working Group on the Medium- and Long-Term Modalities of the Japanese Financial Industry. The task force is now discussing possible improvements to domestic and cross-border payment services. Discussions are also being held on the linkage between payment information and remittance information in the workshops on commercial finance that the Bank has been holding since July 2013 to deepen the discussion on the use of remittance information for financing.

[44] In 2007, the distribution industry adopted distribution business message standards (BMS) as standard EDI for the industry. More than 147 retailers (as of October 1, 2013) and more than 5,792 suppliers (estimates as of June 1, 2013; out of these businesses, 205 have disclosed their names) were using or planned to use the distribution BMS.

[45] An institute aiming at the rationalization and standardization of the distribution system, originally established as a not-for-profit foundation in 1972 based on the recommendation of the Council for Promoting the Introduction of Distribution Systems which was created by the then Ministry of International Trade and Industry. It became a general incorporated foundation in 2012.

IV. Initiatives for Strengthening Business Continuity Arrangements

A. Strengthening Business Continuity Arrangements at Private-Sector Payment and Settlement Systems and Financial Markets

Payment and settlement systems are important social infrastructures and should have in place business continuity arrangements that address a wide range of events posing a risk of operational disruptions. Such events may include natural disasters (e.g., earthquakes, floods, typhoons), technical disasters (e.g., system failures), man-made disasters (e.g., terrorist attacks), as well as other types of disasters such as pandemic outbreaks.

Based on the lessons learned from the Great East Japan Earthquake of 2011 and the initiatives taken by the government after the disaster, and in light of the strengthened standards for business continuity arrangements in the PFMIs,[46] private-sector payment and settlement systems are carrying out discussions and taking actions to strengthen their business continuity arrangements. Such actions include review of disaster scenarios, development of detailed guidelines for business continuity plans, and enhancement of in-house power generating capabilities. Moreover, various efforts are being made to further strengthen their arrangements, which include enhancing emergency personnel and back-up arrangements for computer centers and offices, improving coordination with participants, and conducting disaster management exercises on a regular basis.

At the market level, participants in the money market, the securities market and the FX market have each established procedures for exchanging information and discussing and communicating changes in market practices in times of disaster. In addition, since 2010, as part of the efforts to strengthen the resilience of financial markets, the three markets have been conducting joint exercises of market-wide business continuity arrangements. In February 2013, a joint exercise was held simulating responses to the outbreak of a Tokyo inland earthquake.

[46] For example, while the previous standards required that systems should resume operations in a "timely" manner, the PFMIs specifically require that the plan be designed to ensure that "critical information technology (IT) systems can resume operations within two hours following disruptive events." (Principle 17. Key consideration 6)

In the financial services industry as a whole, the JBA conducted a so-called "street-wide exercise"[47] in 2010, testing the efficacy of business continuity arrangements against the pandemic spread of the novel influenza. In 2012 and 2013, the JBA held exercises simulating an occurrence of a large-scale earthquake, with the participation of the FSA and the Bank.

From the viewpoint of further strengthening the business continuity arrangements in financial markets and financial institutions and enhancing the robustness of Japan's financial systems as a whole, an important priority would be to further strengthen the contents of the exercises and to expand the scope of participants beyond private-sector payment and settlement systems and other intra-industry entities, aiming at conducting cross-sectional exercises with the participation of various social infrastructure providers.

B. Actions Taken by the Bank

For many years, the Bank has been working to strengthen its business continuity arrangements to ensure that it continues to fulfill its responsibilities as a central bank with minimum impact on operations even in the face of a range of disasters.

Since fiscal 2011, the Bank has assessed and reviewed its business continuity arrangements and has considered how to proceed with its mid-term planning, based on its experiences from the Great East Japan Earthquake, as well as other considerations such as the damage scenarios and countermeasures against large-scale earthquakes (such as Nankai Trough and Tokyo inland earthquakes) which are currently under discussion at the Japanese government's Central Disaster Management Council. In particular, the Bank has placed priority and continues to work on an assessment of the preparedness of its current

[47] Street-wide exercise are exercises in which a number of organizations set a common disaster scenario, based on which each organization more or less simultaneously conducts simulation on its countermeasures against the damage, takes the results to the group as a whole to identify common issues, thereby prompting all the participants to develop or enhance their business continuity arrangements. Such a group may be formed at different levels, for example within an industry, across industries, at the level of a region, or a country. In the United States and the United Kingdom, cross-industry exercises (sometimes referred to as market-wide exercises) are conducted in which electricity, gas, and telecommunications providers also participate.

arrangements against a prolonged outage of public transportation systems. The results of the Bank's assessments were released in May 2012 (available only in Japanese).

At the same time, the Bank has conducted practical exercises based on diverse disaster scenarios in order to improve the effectiveness of its arrangements. In fiscal 2012, it conducted a "blind" exercise for establishing a disaster management team, in which the participants were given information on some part of the scenario for the first time on the spot. It also conducted an exercise for continuing operations at an alternative office, and an exercise simulating a switchover of the Head Office operations of the Bank to its Osaka branch under the assumption that the Head Office was severely damaged. Also, the Bank continues to enhance its scenarios for the BOJ-NET recovery exercises, which aim to test the switchover to the back-up computer system and its connectivity with participants' systems, with wide participation from financial institutions and private-sector payment and settlement systems.

In addition to the above efforts, the Bank is focusing on the development of arrangements to respond new types of threats. In response to the implementation of the Act on Special Measures for Countermeasures against Novel Influenza and Other Diseases in April 2013, the Bank, as a designated public corporation, has been working on the preparation of business plans and the enhancement of its business continuity arrangements for novel influenza and other diseases.

Meanwhile, the Bank has reviewed the business continuity arrangements of private-sector payment and settlement systems and financial institutions through its oversight, on-site examinations, and off-site monitoring, and, where necessary, has encouraged them to strengthening their plans. The Bank seeks to enhance private-sector expertise on business continuity planning through seminars held by the Center for Advanced Financial Technology and the releases of questionnaire survey results,[48] and supports discussions at industry groups. The Bank believes that these efforts have contributed to the development and enhancement of business continuity arrangements in private-sector payment and settlement systems and financial institutions on the whole, which is steadily advancing both in breadth and depth.

[48] A recent example is the *Questionnaire Survey on Business Continuity Management* (September 2012) by Bank of Japan, Financial System and Bank Examination Department, March 2013.

V. Conclusion

As one of the critical infrastructures supporting society, payment and settlement systems need to quickly respond to changes in its environment, including the globalization of financial markets and advances in technology, in order to offer a higher level of efficiency while managing various risks. From this perspective, the Bank plans to work on the following issues in the near future in close cooperation with payment and settlement system operators, participating financial institutions, overseas central banks, and relevant authorities.

First, with respect to the BOJ-NET, which underpins payment and settlement systems in Japan, the Bank will steadily push ahead with the establishment of the new BOJ-NET. Thanks to the understanding and cooperation of participating financial institutions and relevant payment and settlement system operators, the development work has been making steady progress. At present, the Bank is working toward the implementation of Phase 1, scheduled for January 2014, and that of Phase 2, scheduled for sometime between autumn 2015 and early 2016.

Second, through its oversight of private-sector FMIs, the Bank will continue to work toward the improvement of safety and efficiency of those systems in accordance with *The Bank of Japan Policy on Oversight of Financial Market Infrastructures*. Specifically, the Bank will assess the compliance of FMIs against the PFMIs published in 2012, focusing on requirements that were strengthened or newly introduced, and induce change where necessary. For FMIs planning on important changes to IT systems, the Bank will extend necessary support while closely monitoring the status of such projects.

Third, the Bank will continue to provide its utmost support toward the implementation of market participants' initiatives to review market practices or develop new arrangements, including those on the shortening of the JGB settlement cycle to achieve T+1 for outright transactions and on linking payment information and remittance information in businesses payments.

Fourth, the Bank will continue to cooperate with other central banks through international fora such as CPSS and EMEAP, and work toward the development and enhancement of cross-border payment and settlement systems. Also, from the perspective of cooperating in securing financial market stability and enhancing means of liquidity provision in times of

contingencies, the Bank will continue to work toward the development of cross-border collateral arrangements while taking into account the needs of overseas central banks.

Fifth, the Bank, as a central bank, will continue to encourage business continuity planning in private-sector payment and settlement systems and financial institutions through the release of sound practice papers and results of periodic questionnaire studies, as well as through its oversight, on-site examinations and off-site monitoring. It will also support street-wide exercises and other initiatives. The Bank also plans to maintain and further enhance the effectiveness and efficiency of its business continuity arrangements through assessments of the arrangements in light of the review of various damage scenarios including those for a Tokyo inland earthquake, as well as through practical exercises which will include coordination with relevant authorities and financial institutions.