

Toward Further Development of the Repo Market

Financial Markets Department
Nobukazu Ono, Kouga Sawada, Akira Tsuchikawa

April 2015

In money markets both inside and outside Japan, repos have been a major instrument in both borrowing and lending of cash and securities. With the recent global financial crisis in mind, discussions are taking place at international forums such as the G20 and the Financial Stability Board (FSB) on how to further increase the stability and transparency of repos and securities lending. Within Japan, it is vital to improve the efficiency of repos and speed up settlement even further, since there is demand for a facility that allows the rapid execution of same-day settlement of repos to shorten the Japanese government bond (JGB) settlement cycle. The Bank of Japan has been participating actively in these discussions and will continue to contribute, as the central bank, to further improvement of the stability and efficiency of repos and development of the repo market.

Introduction

Repos are transactions that involve the exchange of cash and securities for a set period. Repos can be broadly divided into "general collateral (GC) repos," where the securities to be used as collateral are not specified, and "special collateral (SC) repos," where the securities are specified. In both cases, they provide an important function in many major markets as a means of borrowing and lending cash and securities.¹

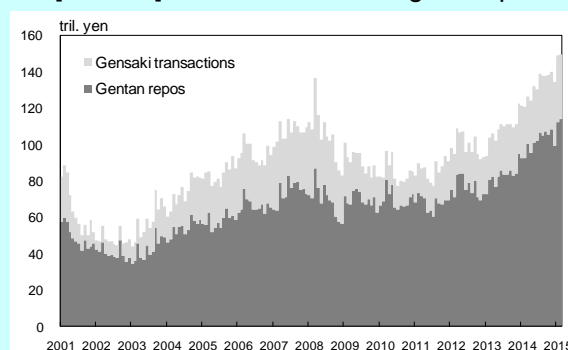
Repos can be considered from the perspective of the initial recipient of the cash as "borrowing of cash against collateral." In particular, repos that utilize government bonds and other financial assets with high creditworthiness and liquidity are a valuable means of ensuring the smooth short-term funding of market participants, including in a situation when the market is under stress. On the other hand, from the viewpoint of the initial recipient of the securities, repos provide a relatively safe means of lending money, and SC repos function as an important tool for borrowing of securities by securities companies and others for delivery.

State of Repos in the Tokyo Money Markets

The repo market has seen a steady expansion in the Tokyo money markets. According to the statistics from the Japan Securities Dealers Association, repos

grew continuously after they bottomed out in 2003. They declined temporarily in 2008 due to the global financial crisis triggered by the collapse of Lehman Brothers, but have risen markedly in recent years (Chart 1).

[Chart 1] Amount Outstanding of Repos



Source: Japan Securities Dealers Association.

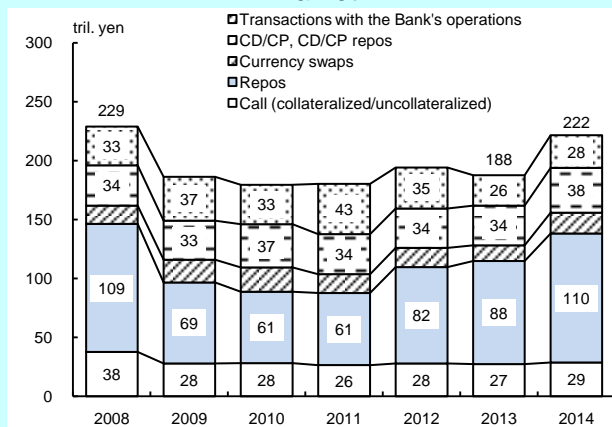
There follows a general overview of the current state of the repo market in Japan, based on the Tokyo Money Market Survey,² which is conducted by the Bank's Financial Markets Department.

Amount outstanding in the repo market

Looking at the money markets as captured by the above survey in 2014 (with the data as of end-July 2014), the amount outstanding of repos³ increased significantly from the previous year, returning to 110 trillion yen, roughly the same level as that posted in the summer of 2008 before the collapse of Lehman Brothers. In the meantime, call and other transactions remained more or less unchanged in the prevailing low-interest-rate environment (Chart 2). As a result,

the amount of repos now accounts for half of the total transaction amount in the money markets.

[Chart 2] Amount Outstanding in the Money Market



Note: Cash borrowing side.

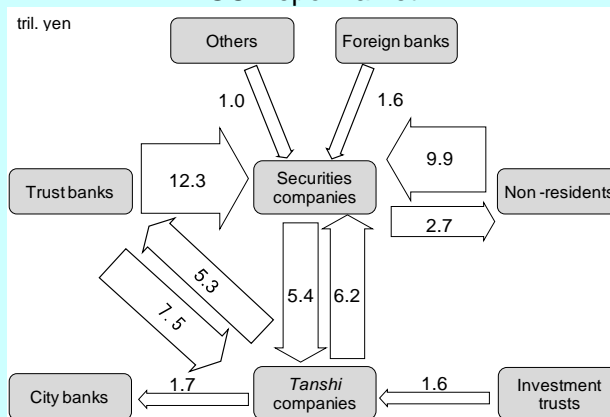
Repo market participants

A look at the market participants in Japan's repo market (Chart 3) shows that securities companies have a large presence. This reflects the need for securities companies to use SC repos to borrow securities for delivery, and also the use of GC repos to finance their inventory of securities. By contrast, in the collateralized call market, city banks have a large presence, particularly on the cash borrowing side.

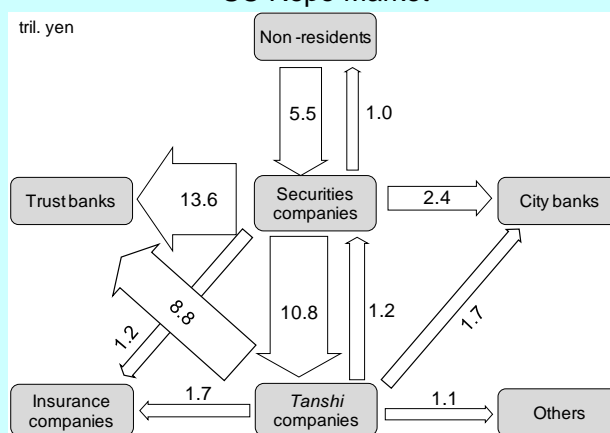
Moreover, trust banks also have a relatively large presence in the repo market. This is because trust banks are important providers of cash in the GC repo market as well as significant providers of securities in the SC repo market. Trust banks conduct these repos for their own banking operations as well as they carry out the transactions on behalf of customers (institutional investors and others) that have entrusted them with assets. For example, investors wishing to increase their returns by actively using their bond positions can consign their holdings to the trust banks (securities management trusts). The trust banks borrow cash with a relatively low interest rate by lending these securities to securities companies via SC repos, while lending the cash in the GC repo market and the collateralized call market. In addition, non-residents (hedge funds, overseas central banks, and foreign banks) use repos to obtain JGBs or for short-term fund management.

At the same time, money market brokers (called *tanshi* companies) act as intermediaries in the repo market and have a certain presence, just as they do in the collateralized call market.

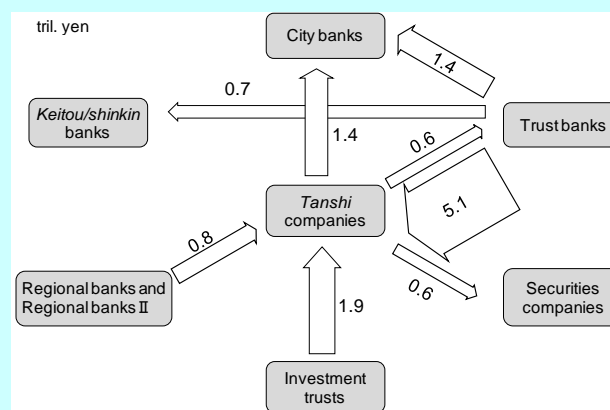
[Chart 3] Amount Outstanding among Sectors (Gross Basis, 2014) GC Repo Market¹



SC Repo Market¹



Collateralized Call Market²



Note: 1. Includes only the major transactions. The arrows show the direction of flow of cash (bonds flow in the opposite direction) on the cash borrowing side. Transactions for non-residents and others are on the basis of the cash lending side.

Note: 2. Indicates only the major transactions. The arrows show the direction of flow of cash (bonds flow in the opposite direction) on the cash borrowing side.

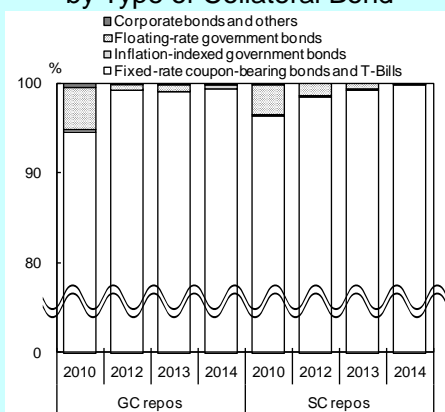
A comparison of the collateralized call market with the repo market (both on the cash borrowing side) shows that the amount outstanding of the top eight participants is 90% of the amount outstanding in the collateralized call market, whereas the top 19 and the top 21 participants account for 90% of the GC repo market and SC repo market, respectively.

Accordingly, it can be seen that the degree of concentration is higher in the collateralized call market than in the repo market, and thus the main players in the repo market are more dispersed.

Collateral for repos

One feature of Japan's repo market, as compared to major overseas markets, is that more than 90% of bond repos uses JGBs (Chart 4). Even if repos and securities lending that use securities other than bonds such as equities are included, JGB repos make up about 90% of the total amount outstanding of all these transactions.

[Chart 4] Share of Amount Outstanding of Repos by Type of Collateral Bond



Note: Bond lending side.

Contract types for repos

Another feature of the Japan's repo market is that, for historical reasons, there are three types of repo contracts.

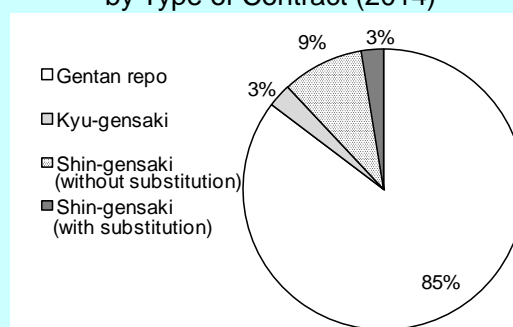
That is to say, repos overseas that consist of two exchanges of cash and securities generally refer to a "repurchase agreement (repo)" in a legal sense. On the other hand, there are contracts that consist of borrowing/lending of cash and securities, and these are referred to as "securities lending" and are distinguished from repos.

In contrast to this, repos in Japan can be either (1) "gensaki transactions," which are repos configured as transactions consisting of a bond purchase with a promise to conduct a repurchase in the future, or (2) "gentan repos," in which cash is used as collateral to borrow securities. Additionally, the former gensaki transactions can be divided further into (a) new gensaki (shin-gensaki) transactions, which have clauses related to substitution⁴ (the right to substitute the purchased bonds during the transaction period) and risk management (e.g., a haircut, which will be discussed later) written into the basic contract, and (b) old gensaki (kyu-gensaki) transactions, which have no

such clauses. In this way, the transactions referred to as repos in Japan are split into three types with correspondingly diverse administrative requirements, which can be considered as one factor that impedes efforts to improve efficiency and IT systems in a way that covers the entire range of repos.⁵

According to the share of the amount outstanding of repos by type of contract as reported in the Tokyo Money Market Survey (Chart 5), it is apparent that gentan repos using borrowing/lending contracts account for more than 80% and the proportion is dramatically higher than in major overseas markets.⁶ The fact that gentan repos, generally seen as "repo transactions" in Japan's financial markets, have the same legal characterization that "securities lending" in major overseas markets does sometimes increased communication costs between related parties in Japan and market participants and authorities overseas.

[Chart 5] Share of Amount Outstanding of Repos by Type of Contract (2014)



Note: Total of cash borrowing and lending.

International discussions on repos and securities lending

Background of the international discussions

Drawing on the lessons learned from recent global financial crisis such as the collapse of Lehman Brothers in 2008, a range of discussions are being promoted at international forums such as the G20 and the FSB, with the aim of further increasing stability and transparency of repos and securities lending.⁷

In the United States in particular, the use of repos and securities lending with securitized products expanded before the financial crisis. There is a growing awareness that such "shadow banking"⁸ may have led to increased leverage and excessive risk taking. Specifically, it has been pointed out that funding through repos and securities lending using complex and illiquid securitized products made it possible to structure other securitized products. Similar problems have been pointed out in developed

countries other than the United States.

Against this backdrop, the G20 and the FSB have pursued discussions with the aim of addressing risks and increasing transparency of repos and securities lending, as part of a wider initiative to mitigate to financial stability risks caused by "shadow banking." The specific work has been conducted mainly by the FSB workstream, and some results have already been made public in the form of FSB reports (Chart 6).

[Chart 6] Discussions by the G20 and the FSB

Nov. 2010	The G20 asked the FSB to develop recommendations to strengthen the oversight and regulation of the shadow banking system (Seoul summit).
Nov. 2011	The G20 acknowledged the FSB report (2011), and consideration for strengthened regulation was begun (Cannes summit).
Aug. 2013	The FSB report (2013) was released, and regulation of repos and securities lending excluding the regulatory framework for haircuts was finalized.
Oct. 2014	The FSB report (2014) was released, and the regulatory framework for haircuts was finalized, excluding some parts.
Nov. 2014	The FSB published the public consultation report on data collection and aggregation for repos and securities lending.

In particular, two reports published in August 2013⁹ and October 2014¹⁰ contained policy recommendations on increasing transparency and strengthening risk management in repos and securities lending (Chart 7). We elaborate on the contents of these reports below.

[Chart 7] FSB's Main Policy Recommendations

Recommendation	Summary
Data collection	Authorities should collect data on the amount of repos and securities lending and on other items at the national/regional level and at the global level to improve transparency.
Qualitative standards for methodologies to calculate haircuts	Authorities should set qualitative standards that must be satisfied by the methodologies used to calculate haircuts on non-centrally cleared repos and securities lending.
Numerical haircuts floors	For non-centrally cleared repos and securities lending in which banks provide financing to non-banks, authorities should introduce the framework of numerical floors for haircuts by type of collateral, excluding government bonds.
Regulations on re-hypothecation of client assets	Authorities should regulate re-hypothecation activity, in which client assets deposited for a certain period as part of repos and securities lending are reused by financial intermediaries in another transactions.

Initiatives to increase transparency

Strengthening data collection

In its August 2013 report, the FSB set out its policy recommendation for strengthening data collection at both the national/regional level and the global level to increase transparency for repos and securities lending.

That is, the FSB asked that the national/regional authorities collect granular data on repos and securities lending such as value and collateral, and report them to the FSB on a monthly basis. The FSB envisages making information on global trends in repos and securities lending available to the public on a periodic basis based on the reported data.

An FSB Data Experts Group (DEG) has been considering how to implement this data collection, and in November 2014 the FSB published a consultative document¹¹ containing details on data elements and data architecture. The FSB will take on board the results of this public consultation and put together the final scheme by the end of 2015. The Bank and the Financial Services Agency are taking part in the DEG.

In parallel with the international discussions described above, individual countries and jurisdictions have been considering their own data collection for repos and securities lending. For example, in the European Union, the European Commission published a document titled "Regulation of the European Parliament and of the Council on Reporting and Transparency of Securities Financing Transactions"¹² and is deliberating on it with a view to requiring participants in the repo and securities lending market to report transaction data to trade repositories. In the United States, the Department of the Treasury's Office of Financial Research has announced that it will work with related authorities to collect bilateral repo transaction data on an experimental basis.¹³

It goes without saying that when collecting data on repos and securities lending, careful attention should be paid to the feasibility of market participants given the administrative processes, IT systems, and so on. Still, the data collection project itself is being positioned as the key to increase the transparency of the repo market as part of an international initiative. Actively engaging in these discussions is important both for ensuring international trust in the Tokyo money markets and for boosting their competitiveness.

Initiatives to address financial stability risks

A range of work has also been taking place on measures to address the risk and improve the stability of repos and securities lending.

Qualitative standards for methodologies to calculate haircuts

In its October 2014 report, the FSB asked that regulatory authorities set qualitative standards for the methodologies which market participants use to calculate "haircuts" in repos and securities lending.

A "haircut" is a percentage deduction from the market value of collateral in proportion to factors such as fluctuations in the collateral price (market risk), with the intention to increase the safety of the transaction. For example, with a *gentan* repo, subtracting the weighting from 1 gives the haircut (If the weighting is 95%, then the haircut is 5%). The larger the haircut, the higher the possibility that the lenders will be repaid their cash and the lower the risk. On the other hand, borrowers of cash can borrow a smaller amount for the same collateral. If the haircut becomes too large, it can prevent the efficient use of the collateral. Moreover, if the demand for cash is fixed, it can lead to the risk being "crowded out" of repos and securities lending and a shift to other kinds of transactions. Accordingly, haircuts should be set at a reasonable level that takes into account the risk of the security being used as collateral.

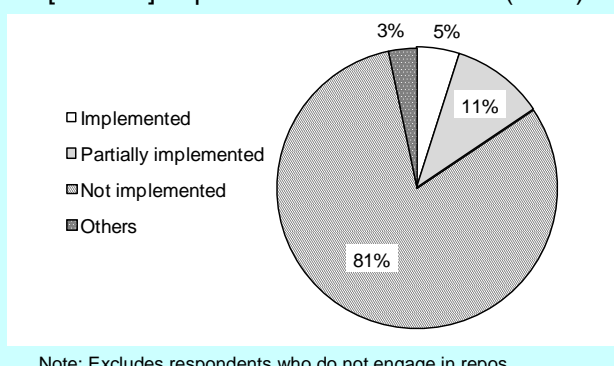
On this point, repos and securities lending used securitized products such as asset backed securities (ABSs) as collateral before the financial crisis of 2008 and mainly in the United States. It is commonly argued that the haircuts applied to these products were too optimistic (too small) because the market risk of these transactions was underestimated. During the financial crisis, the price of ABSs plunged and the haircuts on ABSs were accordingly raised sharply. It has been argued that this led to a liquidity crunch and an acceleration in the downward shift in securitized product prices. The awareness of these problems has driven post-financial crisis actions to strengthen the regulation of repos and securities lending. It has also been pointed out that in Europe, during the European debt crisis, the drop in prices for the government bonds of peripheral eurozone countries led to a significant increase in haircuts for these bonds and caused a further decline in the liquidity of the repo market.

With these experiences in mind, the previously mentioned FSB report asks that authorities in each country establish qualitative standards (methodology standards) for calculating haircuts so that they can incorporate assumptions about market stress in times of financial crisis, such as plunging prices, even in ordinary times. These standards will be applied to all repos and securities lending taking place in the market

that are not cleared by a central counterparty (CCP).

In Japan, haircuts are rarely used (Chart 8), which reflects the fact that nearly all transactions in Japan's repo and securities lending market employ government securities as collateral as explained previously. This is different from the United States, where repos and securities lending using securitized products such as ABSs account for a certain part of these transactions. Nevertheless, in view of the fact that even the market price of government securities which have high creditworthiness can experience fluctuations, it is worthwhile to hold wide-ranging discussions about what measures, including haircuts, could be used to reduce risks and improve the safety of repos and securities lending in the domestic market.

[Chart 8] Implementation of Haircuts (2014)



Note: Excludes respondents who do not engage in repos.

Numerical haircut floors

In the FSB report published in October 2014, regulatory authorities in each jurisdiction are asked to implement "numerical haircut floors," which are calibrated by considering a range of factors such as price volatility risk (Chart 9). The aim of "numerical haircut floors" is to limit excessive build-up of leverage outside the banking system caused by underestimating the price volatility risk and setting too optimistic (too low) haircuts in good time, and to avoid a sharp reduction in transactions in stressed market conditions due to a sudden increase in haircuts.

Whereas the methodology standards explained earlier apply to all non-centrally cleared repos and securities lending, the numerical haircut floors mentioned above exclude, in non-centrally cleared repos and securities lending, transactions against government securities or transactions in which banks are the recipients of cash. In other words, the scope of numerical haircut floors is expected to be the repos and securities lending that use corporate bonds, securitized products or equities and that provide cash to non-banks which are not subject to capital and liquidity regulations for banks. The FSB's reasoning

behind the exemption of government securities is that price movements in government securities tend not to be procyclical, and haircuts on government securities are zero or close to zero for most transactions. Repos and securities lending that are cleared by CCPs will also be exempted from the numerical haircut floors, just as they will be exempted from the methodology standards.

[Chart 9] Numerical Haircut Floors

Residual maturity of collateral	Corporate and other issuers	Securitized products	Main index equities	Other assets within the scope of the framework
≤ 1year debt securities, and FRNs	0.5%	1.0%	6.0%	10.0%
> 1year, ≤ 5years debt securities	1.5%	4.0%		
> 5years, ≤ 10years debt securities	3.0%	6.0%		
≥ 10years debt securities	4.0%	7.0%		

Regulation on re-hypothecation

The FSB has also asked the authorities to regulate re-hypothecation activities, in which client assets deposited for a certain period as part of repos and securities lending are reused by financial intermediaries in other transactions. This is based on the experience of the 2008 financial crisis. The U.K. arm of Lehman Brothers had re-hypothecated client assets deposited in its prime brokerage¹⁴ and other businesses. During Lehman Brothers' bankruptcy proceedings, even confirmation of the details of clients' rights and the whereabouts of assets took an extraordinarily long time. During this period, clients were unable to dispose of their own assets and in some cases were unable to take retake possession of the assets.

On the other hand, if restrictions on re-hypothecation are too strict, they will prevent the efficient use of financial assets employed as collateral and raise the possibility that the risk will simply move from one market to another. The optimal balance between the probability of the client's assets being returned and the efficiency and stability of the markets is not necessarily easy to find. The FSB has established an expert group to take stock of the current regulatory approaches on re-hypothecation and examine their possible harmonization. It is scheduled to compile a report by the end of 2015. The Bank and the Financial Services Agency are taking part in this group.

Shortening of the JGB Settlement Cycle

Summary of the initiative for shortening the JGB settlement cycle

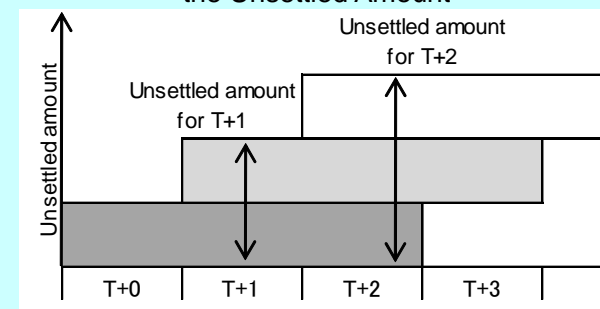
In parallel with the aforementioned international discussions, there is an ongoing initiative in Japan aiming to further shorten the settlement cycle for outright transactions of JGBs from two business days after the trade date (T+2) to T+1.

Since 1997, the standard settlement cycle of JGBs has been T+3. However, in April 2012 the cycle was shortened to T+2. Furthermore, in November 2014 "Working Group on Shortening of JGB Settlement Cycle" established by the Japan Securities Dealers Association published the "Grand Design for Shortening of JGB Settlement Cycle (T+1),"¹⁵ noting that it would "aim to form a consensus among related parties on the timing of T+1 implementation in the spring of 2015," targeting the implementation of T+1 in or after 2017. Since the publication of the Grand Design, market participants have been stepping up their efforts to realize the T+1 settlement cycle for JGBs.

T+0 GC repos

Shortening the settlement cycle and reducing settlement risks would contribute to enhancing the stability and efficiency of the financial market, and would help to strengthen the international competitiveness of the Japanese market (Chart 10). It would also bring significant changes to the repo market.

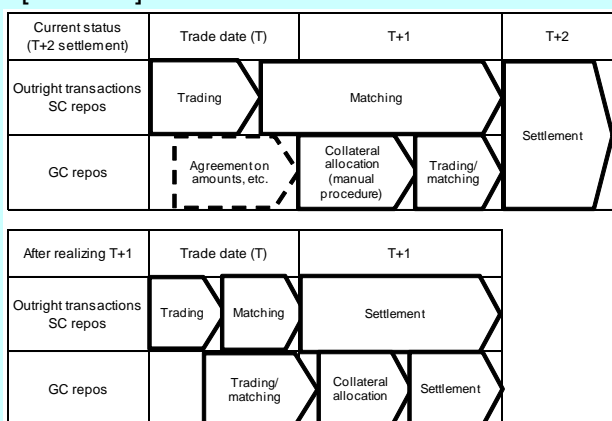
[Chart 10] Shortening of the Settlement Cycle and the Unsettled Amount



To realize T+1 for outright transactions, it is essential to introduce a T+0 settlement cycle to GC repos that are used to adjust the excesses or shortages of cash resulting from outright JGB transactions (Chart 11). To achieve this, much greater speed and efficiency is required for processing repos. To this end, a new GC repo scheme (the subsequent collateral allocation method) will be introduced. For this

purpose, a new collateral management service will be established for T+0 GC repos.

[Chart 11] Basic Picture of the T+1 Mechanism



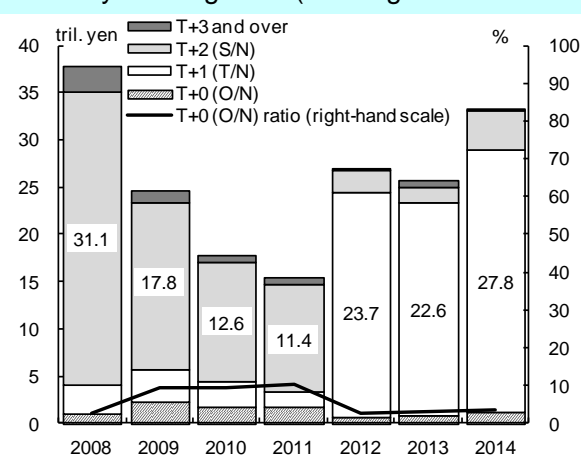
Source: Japan Securities Dealers Association.

Under the subsequent collateral allocation method, parties will only agree on the amount of cash to be delivered and the type of JGBs (the basket) without specifying the individual collateral securities at the time of trading. The allocation of specific collateral securities will be carried out by the entity offering the collateral management services, just before the settlement. In addition, to introduce a T+0 settlement cycle to GC repos, market participants will need to establish a standard market schedule for the matching of trades and standardize and computerize the series of administrative processes from trade to settlement.

Introducing a money market that offers same-day liquidity

Figures on the amount outstanding in the GC repo market by starting date in the Tokyo Money Market Survey indicate that, when T+2 was implemented for outright JGBs transactions in 2012, most of the GC repos moved from T+2 to T+1 (Chart 12). Assuming that GC repos which are currently settled on T+1 shift to T+0 when T+1 is implemented for outright transactions of JGBs, the amount of T+0 GC repos under the subsequent collateral allocation method will likely reach the size of 20 to 30 trillion yen. There is a high probability that such a T+0 GC repo market will become the largest money market in Japan offering same-day liquidity, replacing the place from the call market.

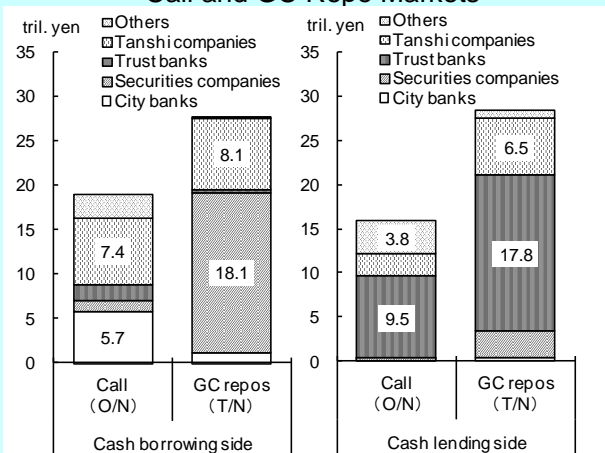
[Chart 12] Amount Outstanding in the GC Repo Market by Starting Date (Overnight Transactions)



Note: Cash borrowing side.

As explained previously, the difference in the structure of the call market and the GC repo market is that, on the cash borrowing side, banks and money market brokers are prominent in the call market, while securities companies are prominent in the GC repo market (Chart 13). The effect on the money markets of creating a T+0 GC repo market will be a point of interest going forward.

[Chart 13] Amount Outstanding by Sector in the Call and GC Repo Markets



Note: Among call transactions, the figures for uncollateralized call transactions include direct dealing transactions.

Vitalizing term-funding transactions

Along with the initiative to shift GC repos to T+0, an effort is being made to further enhance the functioning of the repo market.

The majority of GC repos are currently tomorrow-next (T/N) transactions, that is, overnight transactions starting on the next business day. Market participants suggest that this is due to the fact that the administrative procedure for collateral substitution of term-funding transactions is too cumbersome and therefore, in many cases, overnight repos are executed

repeatedly throughout the actual term. However, the collateral management service to be introduced for T+0 GC repos will offer a substitution function that will reduce the administrative burden of market participants in conducting term-funding transactions. It is expected that an expansion of term repos will contribute to enhancing the price discovery function for collateralized term-funding transactions and the smooth formation of the yield curve.

Shifting to the new gensaki method

Under the subsequent collateral allocation method, the T+0 GC repos will adopt the new *gensaki* method, a more globally accepted form of a repurchase agreement. In addition, the aforementioned working group has indicated its intention to shift SC repos and other transactions to the new *gensaki* method as well. These measures will contribute to the further globalization of Japan's financial markets and lead to the vitalization of Japan's repo market.

Conclusion

As we have seen above, discussions on repos have taken place in international forums such as the G20 and the FSB, drawing on the lessons of the recent financial crisis with the aim of increasing stability and transparency. Some of the results of these deliberations have already been published, and each country/jurisdiction will be required to respond to these going forward. In Japan, the initiative to shorten the JGB settlement cycle also requires a significant increase in efficiency of the domestic repo market, by means such as the establishment a money market that offers same-day liquidity and the introduction of new market infrastructure.

In addition to engaging constructively in these discussions both inside and outside Japan, the Bank has been actively supporting the initiatives of all those involved. Going forward, the Bank intends to contribute, as the central bank, to the increased stability and efficiency of repos and to further development of the market.

¹ In this document, unless otherwise specified, the focus is on transactions that utilize bonds.

² Since 2008, the Tokyo Money Market Survey has been conducted at regular intervals among the counterparties of the Bank's operations and the main participants in the money markets. See the following page for details on the survey. (http://www.boj.or.jp/en/paym/r_menu_ron/index.htm/)

³ The transaction value in the Tokyo Money Market Survey includes both *gentan* repos and *gensaki* transactions.

(http://www.boj.or.jp/en/research/brp/ron_2014/ron141120a.htm/)

⁴ When the seller of a bond urgently needs the bond, the right to substitute another bond and redeem the original has the advantage of making term transactions easier.

⁵ See the Bank's report, which is available for the Japanese version only, released in July 2007.

(http://www.boj.or.jp/announcements/release_2007/tanki0707d.htm/)

⁶ For example, according to European repo market survey (February 2015) published by the ICMA, securities lending accounted for 10.7% of the total, while repurchase agreements, at 89.3%, accounted for nearly all repos.

⁷ The FSB refers to the transaction of the form of purchase and sale as repos and the transaction of the form of borrowing and lending as securities lending. When referring to the FSB's arguments, we use the same wording as the original document, which is "repos and securities lending."

⁸ The FSB defines the shadow banking system as credit intermediation involving entities and activities (fully or partially) outside the regular banking system.

⁹ See the following page for the FSB's August 2013 report.

(http://www.financialstabilityboard.org/wp-content/uploads/r_130829b.pdf?page_moved=1)

¹⁰ See the following page for the FSB's October 2014 report.

(http://www.financialstabilityboard.org/wp-content/uploads/r_141013a.pdf?page_moved=1)

¹¹ See the following page for the consultative document.

(<http://www.financialstabilityboard.org/wp-content/uploads/Glob-SFT-Data-Standards-Consultative-Documents.pdf>)

¹² See the following page for the document published by the European Commission in January 2014.

(http://ec.europa.eu/finance/general-policy/docs/shadow-banking/140129_proposal_en.pdf)

¹³ For more on experimental data collection by the U.S. Department of the Treasury's Office of Financial Research, see chapter 6 of the 2014 Annual Report as per the link below.

(http://www.treasury.gov/initiatives/ofr/about/Documents/OFR_AnnualReport2014_FINAL_12-1-2014.pdf)

¹⁴ Prime brokerage providers offer, mostly to hedge funds, peripheral services such as lending cash or securities, settling transactions, and securities administration. Hedge funds and others use borrowed cash and securities to conduct leveraged transactions and short sales.

¹⁵ See the following page for details of the Grand Design announced by the Japan Securities Dealers Association.

(<http://www.jsda.or.jp/en/newsroom/researches-studies/html/grand-design.html>)

Bank of Japan Review is published by the Bank of Japan to explain recent economic and financial topics for a wide range of readers. This report, 2015-E-4, is a translation of the original Japanese version, 2015-J-5, published in March 2015. The views expressed in the Review are those of the authors and do not necessarily represent those of the Bank of Japan. If you have comments or questions, please contact Akira Tsuchikawa (E-mail: akira.tsuchikawa@boj.or.jp), Financial Markets Department. Bank of Japan Review and Bank of Japan Working Paper can be obtained through the Bank of Japan's Web site (<http://www.boj.or.jp/en>).