

The financial system in transition: the new importance of repo markets

Market developments, the impact of the financial crisis and regulatory measures have greatly enhanced the importance of the markets for securities repurchase agreements, or repo markets, to the financial system in the past few years. Owing to the financial system's central role in transmitting monetary policy measures to the real economy and thus ultimately to price developments, central banks' interest in what goes on in the repo markets is growing. Two trends in particular are posing challenges.

Because short-term loans are increasingly being collateralised with securities, fluctuations in securities prices have a more direct impact on liquidity distribution, particularly between commercial banks. Declining prices of collateral used for repo transactions could lead to rising margins and haircuts and thus to further price losses, which can disrupt interbank liquidity distribution and, in an extreme case, bring it to a halt altogether. In order to stop such a spiral of destabilisation, the central bank would, in extremis, be forced to enter the interbank market as an intermediary.

The growing importance of central counterparties (CCPs), which are becoming established in the repo markets and offer certain advantages to the contracting parties for repos with regard to the handling of collateral, could pose a similar challenge to central banks. If, for instance, the default of a single counterparty were to threaten the CCP itself, the central bank could be forced to act as the liquidity provider of last resort in order to maintain financial stability.

Since both cases could result in systemic risk to financial stability, which would hamper the smooth implementation of monetary policy, it is in a central bank's own best interest to minimise such risks. These markets accordingly need to be regulated and monitored constantly, central financial market infrastructures need to be protected against the default of major players, and the risks associated with repo transactions need to be internalised as comprehensively as possible, ie to be taken into account when pricing repo transactions.

Because repo markets have become more and more important in the monetary policy transmission process, regulation and government intervention in this segment of the financial market are impacting increasingly on monetary policy. The planned financial transaction tax would have a lasting adverse effect on the repo market and would jeopardise interbank liquidity distribution. The likely result would be an increase in bank funding through the Eurosystem, which would not be desirable from a monetary policy and regulatory perspective.

Growing significance of repo transactions

■ Introduction

Repo transactions are by far the most important, and most relevant, form of secured money market transactions. The repo markets are used by financial institutions, securities traders, enterprises and other market participants, particularly to manage their liquidity or fund longer-term investment. The importance of repo transactions has continued to grow in the past few years. This is related to the continuing trend of hedging risks from lending business and confining such business owing to capital adequacy requirements. This trend began prior to the financial crisis and mirrors falling turnover in the unsecured money market. It was amplified dramatically by the crisis. Immediately following the Lehman bankruptcy, the unsecured interbank money market largely dried up in the medium and longer-term segments; no sustained revival of this segment, particularly in the longer maturities, is on the horizon.

The repo markets are undergoing major upheaval, not least due to the financial crisis: the significance of over-the-counter (OTC) repo transactions is tending to diminish, while electronic repo trading platforms and the attendant settlement infrastructures are not only gaining market share but are also making a tangible contribution to the growth of these markets. In addition, since the crisis, money market participants have become much more discriminating with regard to the quality of eligible collateral and counterparties.

Repo markets presenting new challenges to central banks, too

Repo markets are an important element of monetary policy because of their special role in the monetary transmission process. The repo markets' growth and enhanced importance have, in recent years, not just "changed the game" for financial market participants but are also presenting supervisory authorities and central banks with a new set of challenges. These challenges affect a wide range of areas – including the operation of payment and securities settlement infrastructures, financial stability analysis and financial market monitoring.

At the same time, the repo markets have become the subject of regulatory initiatives and tax proposals, engendered by the persistent financial crisis.

Given the importance of the repo markets, these regulatory initiatives are likely, in turn, to affect the conduct of monetary policy and the monetary transmission process, which could pose new challenges to future Eurosystem monetary policy. This article discusses the aforementioned aspects in context and concludes that the interests of an effective stability-oriented monetary policy which is consistent with the EU treaty must be maintained when designing the framework for the repo markets.

Interests of monetary policy must be maintained

■ Features of repo transactions

A securities sale and repurchase agreement, or simply repo, is a contract in which the seller sells securities to the buyer while at the same time committing to repurchase the same, or similar, securities at a later date. The repurchase price is equal to the original selling price plus interest on the cash received. From the buyer's perspective, this is also known as a "reverse repo", as the buyer first buys and then resells the securities – the "reverse" of a repo. Depending on the perspective, repos can represent either a loan against securities or securities lending against cash.

Repos are securities repurchase agreements

A repo consists of two transactions, or "legs".

- On the value date, the seller (ie the borrower) sells the securities to the buyer (ie the lender) for an agreed amount.
- Upon maturity, the seller repurchases the securities for the original sum and pays the buyer interest on the money received over the term of the repo.

For the duration of the repo transaction, ownership rights to the collateral pass to the lender. The lender has full control over the collateral

and can use it, for instance, as collateral to take out a loan of his own.

As an alternative to the bilateral repo transactions described above, there is also the option of triparty repo transactions, which make up the majority of repo business in the United States. In a triparty repo, there is a third-party agent between the securities lender and liquidity provider. This agent physically holds the securities posted as collateral; the original counterparties remain the contractual parties to the transaction. The agent (mostly a clearing house in Europe; a clearing bank in the United States) manages the collateral, makes substitutions whenever necessary, monitors the risk and collects the margin. Should the agent default, the liquidity provider maintains legal ownership of the securities.

Special securities or baskets of securities can be accepted as collateral

If the parties to a repo transaction agree on a specific security as collateral, this is known as a special repo. Conversely, General Collateral (GC) repos refer to a selection (say, a list) of securities. The list of eligible securities (GC basket) can comprise, for instance, euro-area government bonds. GC repos are always money-driven: they are conducted because the borrower wants to obtain liquidity. Special repos, by contrast, are mostly securities-driven: the lender is looking for a very specific security. Special repos can be used, for instance, to meet delivery obligations from a short sale.

In order to protect both parties to the contract against the other's possible default, the value of the pledged collateral should correspond roughly to the cash value of the repo. There is a further risk of loss if the market for the security pledged as collateral is not sufficiently liquid. The security might then have to be sold below its valuation price. Therefore, margins or haircuts are usually agreed for repo transactions.

The securities' market value may change during the lifetime of the repo. Variation margins are calculated for such changes in asset prices. The collateral is marked to market, generally on a

daily basis. If the collateral value falls, the borrower has to pledge additional collateral. If the collateral value increases, the borrower receives collateral back.

The repo rate represents the interest payable upon expiration of the repo. Most repo contracts are set at fixed rates. For floating-rate repos, the repo rate is based on a benchmark interest rate with an agreed premium or discount. The repo rate changes in line with the benchmark interest rate. The rates on special repos are mostly slightly below the GC rates because, in the case of special repo transactions, the collateral provider is required to pay the repo rate although he often does not actually need liquidity. If he reinvests the cash received as a GC repo, he can obtain interest income; however, there are also risks involved in such transactions. If demand for a certain security is particularly high, the special repo rates could be well below the corresponding GC repo rate.

Repo rates usually fixed

Repos are settled OTC or on exchanges and via central counterparties (CCPs). The volume of OTC repos is significant and the process is not very transparent, as there are generally no supervisory reporting requirements for market participants. Trading in a regulated market such as an electronic exchange makes trading activity transparent in terms of price formation, the ratio of supply to demand and the volume of contracts concluded, and ensures the anonymity of sellers and buyers at the time of the trade. If these trades are settled via CCPs, this anonymity is retained during settlement. The neutral CCP ensures that the trading partners remain anonymous in the settlement phase, assumes the obligations incurred and guarantees their fulfilment. In addition, a CCP administers, prices and nets the trading positions and, on the day of fulfilment, settles the payment and delivery legs of each transaction. In the case of money market transactions via CCPs, counterparty credit risk and settlement risk are reduced; at the same time, banking supervisors

Repos can be settled directly or via central counterparties

require less capital backing for these transactions.

Transfer of title to collateral means "re-hypothecation chains" are possible

Because, in a repo, the title to the collateral is transferred to the lender, the lender can, in turn, pledge the securities received as collateral for a further repo. "Re-hypothecation chains" may be the result. Although the re-hypothecation of collateral increases the securities markets' liquidity and reduces each individual bank's liquidity management costs, re-hypothecation chains can be problematic in terms of financial stability: if one actor in a re-hypothecation chain defaults, other actors in the chain could end up not being able, in turn, to return an owed security once a repo reaches maturity. The actors would then be liable for damages where the value of the collateral exceeds the repo's repayment amount. The interconnectedness between banks and the shadow banking system is viewed as particularly problematic. Because of lower capitalisation, some shadow banks are generally less able to absorb shocks.

Participants and structure of repo markets in Europe and Germany

Repos used by market participants for a wide variety of purposes

Banks and financial services providers use repos to manage their liquidity, cover short sales, build up leverage or hedge interest rate risk. Investors such as mutual funds, pension funds, insurers and corporate treasuries use repos to invest surplus liquidity or obtain additional returns on their portfolios.

Repo market grew rapidly until financial crisis ...

The repo markets are important but, like other OTC markets, relatively intransparent. In Europe, the repo market grew rapidly, in terms of outstanding volume, until the financial crisis; it has fluctuated considerably since then (see the chart on page 62). The International Capital Market Association (ICMA) estimates the total volume of contracts outstanding in the European repo market at around €6 trillion at present. Business is strongly concentrated, with

the 20 leading institutions accounting for 80% of trading activity. Two-thirds of repos have a maturity of not more than one month, most not more than a week; the vast majority of the remainder has a maturity of up to one year.¹

A Eurosystem money market study has shown that the secured money market – despite a drop in turnover in 2008 and 2012 – remains the largest money market segment in Germany and Europe. According to the latest Euro Money Market Survey, the secured money market is around eight times the size of the unsecured money market in terms of transaction volume.²

The Eurosystem money market survey also inquired about the counterparties' country of origin. Unsecured money market turnover in Germany in 2013 showed a declining trend in cross-border trading with euro-area counterparties (around 27%, as against 47% in 2007). By contrast, in 2013 some 50% of turnover in the secured market was with euro-area counterparties; it can thus be said that the borders between euro-area countries play a less restrictive role in the secured market, as expected.

... and is currently the most important money market segment

Secured money market transactions dominate

Importance of repos for bank funding in Germany

As part of its monthly balance sheet statistics, the Bundesbank collects data on repos of banks domiciled in Germany. The bulk of both asset-side and liability-side domestic transactions are conducted between banks or between banks and CCPs. Banks' liability-side repo funding makes up around 5% of their total assets (see the chart on page 64). Around 25% of these outstanding repos are overnight transactions. Another approximately 72% have a maturity or notice period of up to one year. In similar fash-

Key role in German banks' liquidity management and funding

¹ See ICMA, European Repo Market Survey June 2013, Survey No 25, September 2013.

² See European Central Bank, Euro Money Market Survey, November 2013.

Infrastructure developments in the European repo market

Growing importance of settlement infrastructure

Upheaval on the money market and the trend towards secured financial transactions are enhancing the importance of the securities settlement infrastructure.

On the European repo markets, over-the-counter (OTC) trading has increasingly migrated to trading platforms involving a central counterparty (CCP), although bilateral trade in certain securities is still attractive for some banks.

It is evident that the market infrastructure is currently still deeply fragmented. Although CCPs are the main clearing houses, central securities depositories (CSDs) and their securities settlement and collateral management systems are also significant. Both of these private infrastructure segments – CCPs and CSDs – must interact with central bank infrastructures in order to settle payments in central bank money via payment systems, for example.

International clearing and settlement market for Eurobonds split between two CSDs

During clearing, reciprocal claims, liabilities and delivery obligations are determined. The clearing process involves transmitting, coordinating and, in some cases, confirming transactions and other modalities (eg payment channel, place and time of delivery). Clearing and settlement houses operate at a national or international level. Within the EU, the two international central securities depositories (ICSDs) Euroclear in Brussels and Clearstream in Luxembourg have divided up the international clearing

and settlement market for Eurobonds (ie bonds denominated in euro that were issued in a non-euro-area country) among themselves. Securities denominated in local currency are generally still held in custody and settled by the respective national CSD, although the two ICSDs have also increasingly been settling national securities since the launch of European monetary union. However, more and more links are being established among national CSDs as well as between national CSDs and ICSDs. This makes it easier to settle cross-border repo transactions. In the future, the Eurosystem's TARGET2-Securities (T2S) project will enable a uniform settlement of securities in central bank money within Europe. This will allow cross-border repo transactions to be settled even more cost-effectively. CSDs will give up their individual settlement systems and use a single platform. This will, it is hoped, cut the at present considerably higher cost of cross-border transactions and bring it more in line with the cost of national transactions.

Interoperability between CCPs being strengthened

In July 2013, the two ICSDs and Clearstream Banking AG and Eurex Clearing AG reached a cooperation agreement strengthening the interoperability of their systems (triparty settlement interoperability initiative). This agreement aims to improve the interoperability of the settlement and collateral management systems by 2015, making it easier to move securities between the infrastructures and reducing collateral pool fragmentation. This will, it is hoped, result in more efficient collateral management within Europe.



The significance of the euro-area repo markets for monetary policy

Defining and implementing a single monetary policy is the Eurosystem's central task. The primary objective of monetary policy is to maintain price stability. The Governing Council of the ECB takes its monetary policy decisions on the basis of broadly based analyses, including analyses of the repo markets. The Eurosystem then implements the Governing Council's monetary policy decisions using the instruments contained in the monetary policy toolkit. Monetary policy refinancing operations – reverse open market transactions which provide commercial banks with liquidity against collateral on a revolving basis – are a central instrument. The central bank is the initiating party.

Repo markets relevant for preparing decisions and implementing monetary policy

Central banks have traditionally used open market operations as a way to influence the banking system's aggregate liquidity position vis-à-vis the central bank in order to manage short-term money market rates (money market management). The short-term money market rates, in turn, influence the rates of interest on other longer-dated financial instruments and the rates of interest on bank loans and deposits (the interest rate channel of monetary transmission).

Repos with other participants in the repo market are a commercial bank's closest substitute for refinancing operations with the Eurosystem. Central banks can use the terms and conditions of their refinancing operations to influence the costs of similar money market transactions between commercial banks. This monetary policy arrangement requires functioning financial markets which transmit monetary policy stimuli effectively to the financial sector and from there to the real economy.

First stage of the interest rate channel of monetary transmission

ion to developments in the European repo market, German banks' repo market financing expanded rapidly up until the outbreak of the financial crisis and has been fluctuating relatively sharply since then.

Significant decline in repo funding for German multinational banks

For German multinational banks, repos are considerably more important than for the German banking industry as a whole. Upon the outbreak of the subprime crisis in the US real-estate market, however, the percentage share of repos in the short-term funding of German multinational banks fell significantly, from nearly 60% before the crisis to 48% just before the Bear Stearns rescue in March 2008. Following the Lehman Brothers bankruptcy, this figure was a mere 35%.³ These figures indicate that access to repos for short-term funding purposes initially became more difficult immediately after the outbreak of the crisis, as the collapse of the subprime market refuted the conventional wisdom that repos based on securitised loans were relatively safe.

The revival, since 2009, of the trend towards secured funding of banks has had implications for unsecured creditors. According to BaFin, some €1,100 billion in euro-area banks' liabilities matured in 2012, 80% of which were unsecured. However, only around 20% of funding was unsecured in 2012.

³ See C Düwel, Repo funding and internal capital markets in the financial crisis, Deutsche Bundesbank Discussion Paper No 16/2013.

Repo markets and central bank policy: an international review

Central banks can influence liquidity via open market operations. As well as outright transactions, these operations include collateralised loans, which are very similar to repo transactions and which are also sometimes referred to as such by the central banks. The Federal Reserve began using repos as early as 1917 to provide loans to banks. In the following decade, the Federal Reserve also began to use them to provide loans to securities traders. The use of repo transactions was temporarily suspended during the Great Depression and the Second World War. The Federal Reserve did not reintroduce this type of transaction until 1949. In 1951, the US Congress approved the Treasury-Federal Reserve Accord. This established the independence of the Federal Reserve, which gained control over monetary policy, and repos became attractive once again.

In the 1970s, a number of countries introduced repo transactions as a monetary policy instrument. In the United Kingdom, repos with government securities as collateral first began to be used on a daily basis in 1997. Japan and Switzerland started using repos in 1997 and 1998, respectively. Since the start of European monetary union in 1999, the Eurosystem has used refinancing operations, which are very similar to repos, as a fundamental monetary policy instrument.¹

Repos have become an important monetary policy instrument for central banks. Through repo transactions, central banks can manage liquidity in the money markets and signal the target interest rate to market participants. In addition, conditions for repo trans-

actions between private parties give an insight into market participants' expectations of monetary policy in the near term. A number of central banks additionally use repos to manage their foreign reserves. Repos widen the spectrum of investments.

The repo markets have benefited from the use of repos as a monetary policy instrument. More banks have become active on the repo markets through the central banks' repo transactions. By supplying the banking system with additional liquidity through repos, central banks helped to keep the banks solvent during the financial crisis.

¹ See also Bank for International Settlements, Implications of repo markets for central banks, CGFS Working paper, March 1999.



During the ongoing financial crisis, the Governing Council of the ECB has regarded this transmission process as being disrupted. To ensure the efficacy of monetary policy measures, it adopted temporary non-standard monetary policy measures. Because the euro area's financial system is largely bank-based, the central non-standard monetary policy measures were tailored to the banking system (fixed-rate full allotment in refinancing operations, extension of collateral pool). These measures, in turn, impacted on activity in the repo markets and tended to reduce turnover.

The repo markets during the financial crisis

Loss of confidence during financial crisis also hurting repo markets

The loss of confidence as a result of the financial crisis has not only caused the medium and longer-term segments of the unsecured inter-bank money market to dry up, but also affected the international repo markets – although transactions there are collateralised. From mid-2007 onwards, the repo markets came under pressure as doubts about securities' quality and current market valuations spread. Strains on the US repo market spilled over to international repo markets. Financing conditions tightened; increasingly, collateral had to constitute highly rated and liquid government bonds. Invest-

ment banks such as Bear Stearns were suddenly faced with funding gaps because large parts of their extensive securities portfolios that were backed by short-term assets were no longer accepted as collateral on the US repo market. With the default in September 2008 of Lehman Brothers, which was particularly active on the repo markets, the liquidity crisis, which had previously been simmering in Europe, developed into a fully-fledged financial crisis. The repo markets could then only be used for high-quality securities, and this by itself was not enough to ensure banks' liquidity.

On the European repo market, the growing risk aversion that had emerged in 2010 in the wake of the sovereign debt crisis reduced acceptance of securities from certain EU countries. Market participants began to differentiate more between the creditworthiness of government bonds issued by different euro-area countries. Bonds of countries that market participants believed to pose a higher credit risk were rarely accepted as collateral. However, on the whole, the share of euro-area government bonds in repo transactions in Europe remained relatively stable at around 80% in the period from 2009 to end-2012.⁴

Segmentation in favour of high-quality securities

On balance, the proportion of government bonds from the peripheral euro-area countries fell sharply. The share of German government bonds dropped only slightly; they attracted increasing demand as secure and liquid assets. The decline in the percentage of bonds issued by peripheral euro-area countries in CCP repo transactions was particularly striking. While the overall market share of German government bonds shrank slightly, on the CCP repo market, French and German bonds, as well as securities issued by public international financial institutions, especially Pfandbriefe, offset these shifts in the securities spectrum.

Reduced use of bonds from peripheral euro-area countries for CCP repo transactions

⁴ See ICMA, European Repo Market Survey December 2012, Survey No 24, March 2013.

Increased significance of general collateral repos

During the financial crisis, the importance of general collateral repos (GC repos), which are cleared on electronic trading platforms involving a CCP, has grown even further. The share of repo transactions cleared via CCPs rose from 37% in 2008 to 65% in 2013. Alongside other electronic trading platforms that involve CCPs, the outstanding volume of Eurex Repo's GC pooling, in particular, rose from €22 billion at the beginning of January 2008 to around €165 billion in mid-November 2013. This was mainly due to a growing circle of counterparties, especially international participants. The number of GC pooling participants increased roughly fivefold to 111 (of which 50 in Germany) in the period from January 2008 to November 2013.

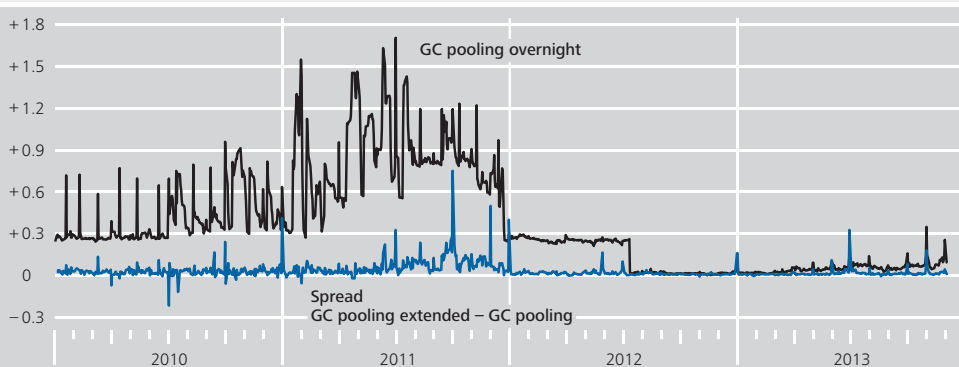
As collateral baskets, Eurex has established, in particular, the general collateral pooling baskets: the GC pooling ECB basket comprises around 7,500 top-quality ECB-eligible securities, the GC pooling ECB EXTENDED basket contains some 25,000 ECB-eligible securities, including bonds with a lower rating. The assets' different credit ratings are

reflected in the fundamentally divergent interest rates of the two GC pooling collateral baskets (see chart below).

After the Eurosystem allocated a record volume of liquidity to the banks with its two three-year tenders at year-end 2011-12, excess demand for liquidity has given way to excess supply in the GC pooling market. Now borrowers, not creditors, determine the interest rates, and the spread between the two repo rates has shrunk. Following the three-year tenders, the difference in the interest rates in the collateral baskets fell to almost zero, as did, in particular, the level of the repo rates overall. Besides excess liquidity, this reflected the low market rates and low yields on top-rated securities.

General collateral pooling rates*

Percentage points, daily data



Source: Eurex Repo. * The general collateral (GC) pooling rates represent money market rates for secured transactions in the interbank market. The GC pooling collateral basket comprises top-quality ECB-eligible securities, the EXTENDED basket also ECB-eligible securities with lower ratings.

Deutsche Bundesbank

The main reason for the increased use of German government bonds in CCP repo transactions, as opposed to the situation on the market as a whole, is that collateral providers in CCP repo transactions can be certain that they will receive their bonds back upon maturity, as securities cannot be re-hypothecated in most CCP repo systems. However, in bilateral OTC repo transactions, it is customary for securities to be re-hypothecated. Market participants were thus hesitant to use their German government bonds for fear of not having them returned.

Eurosystem measures during the financial crisis

Monetary policy prior to financial crisis: competitive bidding procedures, limited allotment volume, broad group of counterparties and broad collateral framework

As a rule, all euro-area banks that are subject to minimum reserve requirements can conduct refinancing operations with the Eurosystem (broad group of counterparties). The Eurosystem national central banks grant them loans against pledged securities through regular refinancing operations in accordance with the national implementation of single monetary policy. Until the outbreak of the financial crisis, this was achieved using competitive bidding procedures where the allotment volume was determined in advance. This was just enough to cover the aggregate liquidity requirements of the banking system. Of the 6,300 credit institutions in the euro area, around 2,200 are eligible as Eurosystem counterparties and relatively few of these usually take part in refinancing operations.

The Eurosystem accepts a broad spectrum of securities ranging from public bonds to credit claims. It also accepts covered and uncovered bank bonds as well as corporate bonds and asset-backed securities (ABS) with corresponding haircuts.

During the financial crisis, the medium and longer-term segments of the unsecured interbank money market dried up to a large extent. The repo markets also temporarily came under

pressure: first, numerous banks were no longer considered reliable enough to conduct even secured money market operations and, second, securities with lower liquidity and credit ratings were rarely accepted as collateral for repo transactions. To safeguard banks' liquidity and avoid a credit crunch, central banks worldwide took non-standard measures. They purchased securities with low liquidity or provided banks with additional liquidity in the form of secured loans.

The Eurosystem responded to the widespread loss of confidence on the money and financial markets with extensive non-standard monetary policy measures. In order to meet banks' need for liquidity in this extraordinary situation, the Eurosystem decided in mid-October 2008 to apply full allotment in its monetary policy refinancing operations. This full allotment has continued virtually unchanged ever since. Eligible counterparties receive unlimited liquidity as long as they have enough suitable collateral. The Eurosystem also temporarily offered refinancing operations with longer maturities. In 2009 for instance, it conducted three longer-term refinancing operations (LTROs) with a maturity of 12 months; total recourse was in excess of €600 billion. As of December 2011, there were two more LTROs with a maturity of three years. Take-up amongst Eurosystem counterparties was more than €1,000 billion.

This large-scale use of refinancing operations was possible because the Eurosystem had, since October 2008, significantly extended the collateral that it would accept for monetary policy operations. In particular, it lowered the credit threshold (rating requirements) for eligible collateral to ease the shortage of marketable and eligible assets being experienced at many institutions.

For central bank refinancing operations with exceptionally long maturities – as with all non-standard monetary policy measures – there is a danger that private transactions will be crowded out of the markets and market prices

Global financial crisis: central banks respond with non-standard measures

Eurosystem: extensive provision of liquidity through monetary policy refinancing operations

LTROs with full allotment also have potential undesired side effects

will be distorted. The longer these measures are in place, the greater the risk. There are indications that the Eurosystem's large-volume refinancing operations may have crowded out parts of the repo market. ICMA data show a clear slump in the European repo markets in 2008 and 2009. Even in the following years of excess liquidity, the repo markets did not return to pre-crisis growth levels (see the chart on page 62).

Favourable Eurosystem refinancing conditions lessening incentives for banks to regain access to markets

Since the crisis began, the previously uniform repo markets appear to be deeply segmented. Some banks lack eligible assets, or their specific risk characteristics prevent them from raising funds on the funding markets. Others would receive liquidity and funding on the markets but prefer to use the Eurosystem operations in some instances, as the conditions are more attractive than on the private market. Interest rate conditions in relation to the maturity of the operations may be better or the assets accepted as collateral more generous. In particular, the Eurosystem even accepts assets that usually cannot be used as collateral for repo transactions between private parties. It thus reduces the incentives for banks to develop a capital and financing structure that would enable them to regain access to the money and capital markets. The objective of the Eurosystem measures was to ease market distortions during the crisis. However, they also have side effects. There is a danger that the Eurosystem measures will, over time, perpetuate the existing market segmentation. For a broad-based recovery of the euro-area economy, it is essential that the financial sector problems that caused the market segmentation in the first place be resolved.

Challenges for regulators and financial stability policy

Including repo markets in regulation initiatives

During the financial crisis, the repo markets, which are particularly important for short-term financing, experienced sharp distortions. They were therefore included in various regulation

initiatives. As financial markets are interconnected at a global level, new regulation initiatives are often proposed by international committees or organisations working on specific aspects of regulation and financial stability policy.

For instance, a workstream on securities lending and repos organised by the Financial Stability Board (FSB) is currently investigating the shadow banking system and how the variability of margin and haircut requirements for repo transactions impacts on financial stability. The resulting policy recommendations were published at the end of August 2013. A further aspect of regulation issues looks at the central role of CCPs. The Committee on Payment and Settlement Systems (CPSS), which is based at the Bank for International Settlements (BIS), has published a consultative report together with the International Organization of Securities Commissions (IOSCO) on quantitative reporting standards for CCPs to improve the information available on the systemic importance, robustness and potential risks of CCPs. The mechanisms dealt with in this context are numerous and complex, but the following is symptomatic: if investors believe the risk relating to individual securities issuers to be higher, then the participants in the bilateral repo market will tend to increase their margins and haircuts. This could spell funding problems for financial market participants who finance large securities portfolios via repo transactions, and they may have to sell securities to remain liquid. This could trigger a spiral of falling bond prices, dwindling market liquidity, increasing margins and haircuts, and a further drop in lending values. To what extent individual market participants with particular market power can accelerate such a spiral through their margin and/or haircut decisions is the subject of debate. Decisions that are correct and sensible from an individual market participant's perspective may have a detrimental effect on the stability of the financial system. Conclusions for concrete regulations at national or European level have yet to be put forward, but will have an impact on the repo markets.

Repo markets subject of financial market regulation and financial stability policy

Concrete proposals still outstanding

The repo market in the USA

Large outstanding volume of repo transactions in the USA

The largest repo market worldwide, with an outstanding volume of around US\$10 trillion (approximately 70% of US GDP), is still to be found in the USA. The US repo market is predominately based on US Treasury securities, but there are also markets for mortgage-backed securities (MBS) and for corporate bonds.

Unlike in the euro area, only a few banks in the USA have been designated as primary dealers by the Federal Reserve. Monetary policy is thus transmitted by the Federal Reserve as repo transactions via primary dealers to commercial banks.

According to ICMA data, around two-thirds of repos in the United States are what are known as triparty repos. In a triparty repo, a clearing bank provides important services for administering the securities exchanged between the securities lender (cash borrower) and the liquidity provider as well as providing intraday liquidity.

Securities portfolios financed via the triparty repo market

The clearing bank manages the securities which are pledged as collateral. Should the securities lender default, the liquidity provider maintains title to the securities. The triparty repo market is the most important source of funding for investment banks and securities broker-dealers as they can obtain short-term liquidity to finance their securities portfolios. Liquidity providers are usually money market funds, investment funds, asset managers or public authorities with surplus liquidity. Repos are an uncompl-

cated alternative to bank deposits for liquidity providers as the funding is collateralised and can be called daily. The short-term availability is possible due to the daily repayment of all repos, regardless of their maturity. The liquidity provider is paid back the funds it provided and the securities are returned to the securities lender. This approach differs from the procedure employed in Europe, in which repos are only settled upon maturity. As a result, the securities lender in the US repo market (particularly the broker-dealer) experiences a funding gap until the repo is "rewound" at the end of the day. This is usually bridged with intraday credit provided by the clearing bank. In the triparty repo market, a clearing bank assumes the relatively complex task of managing securities (settlement, administration) and the settlement of cash flows for both parties.

Daily repayment harbours risks

As the crisis has shown, this arrangement harbours significant risks. Where there is doubt regarding the creditworthiness of a cash borrower, liquidity providers such as clearing banks are no longer interested in extending their repos or providing intraday credit (bridge loans). Should a broker-dealer default, liquidity providers would have to sell repo collateral in a stressed market environment. This scenario materialised following the collapse of the investment bank Bear Stearns, which put liquidity on the triparty repo market at risk of drying up. Asset fire sales also resulted in financial contagion.

Liquidity regulations increase appeal of longer-term repo transactions for bank financing

Future liquidity regulations, which are part of the Basel III framework, govern banks' behaviour with regard to the term structure of their assets and liabilities, and thus also focus on repo markets as a key source of short-term financing for banks. The new liquidity rules contain defined ratios and thus set specific standards for managing banks' liquidity risk. The liquidity coverage ratio (LCR) records liquidity inflows and outflows for maturities of up to 30 days and the net stable funding ratio (NSFR) for maturities of up to one year. Banks will have to maintain adequate liquidity (or liquid assets) to cover net cash outflows over a 30-day or a one-year period respectively. This raises banks' demand for eligible liquid assets and many banks' interest in a more balanced asset-liability structure. The liquidity regulations planned under Basel III are likely to increase banks' demand for longer-term transactions on the repo market.

Implications of the financial transaction tax

Currently 11 euro-area countries plan to implement a financial transaction tax

The financial transaction tax being discussed in the EU could, if it is implemented, also have a considerable impact on the repo markets. As part of the "enhanced cooperation", 11 euro-area countries are planning to implement a financial transaction tax that also applies to transactions between financial institutions. The tax is to be levied if at least one party in the financial transaction resides in a participating member country (nonetheless, both parties would be subject to the tax) or if the party issuing the financial instrument is located in a participating member country. The tax would therefore apply even if financial instruments are traded outside of the 11 participating countries, provided they were issued within one of the participating countries.

In theory, the tax would consequently apply to the financial activities of financial market participants across the globe. In practice, however, the legal implementation of this tax in foreign juris-

dictions would be problematic. A legally binding minimum tax rate of 0.1% for general financial transactions (including repo transactions) and 0.01% for derivatives transactions is being discussed. The financial transaction tax would impose a very high burden on short-term and revolving repo transactions in particular, as it would be incurred afresh for every transaction.

It is highly likely that the tax would cause the repo market to dry up, at least in the short-term segment, because the tax would be increasingly disproportionate relative to interest income, the shorter the term of the repo transaction. A shift of funding from the repo market to the unsecured money market, where the tax is not applicable, would not be consistent with the future liquidity regulations within the Basel III framework. The Basel III concept of LCR favours secured forms of financing over the unsecured provision of liquidity on the inter-bank market, because unsecured short-term financing is considered less stable following the experiences of the financial crisis.

Another way of avoiding the tax would be securitised lending operations. These are secured transactions in which securities are pledged as collateral. They do not change ownership, as with repo transactions, and might not be subject to the financial transaction tax. However, the financing costs for secured money market operations without ownership transfer are likely to be higher than for repo transactions because the liquidity provider incurs higher liquidity risks as there is no option of re-hypothecation. Another reason why market participants are unlikely to see such transactions as an attractive substitute is that insolvency law differs widely across Europe and this could impair legal certainty. Furthermore, the business model of electronic trading platforms and CCPs would be called into question without there being any alternative solutions available.

If the repo market were to shrink as a result of such a tax, banks would probably increasingly refinance themselves with the Eurosystem.

Lasting impact on repo markets expected

Securitised lending operations no convincing substitute for repo transactions

Outlook: repo markets caught between monetary policy, taxation and regulation

Central banks' focus is on effective monetary policy

Various trends are emerging on the repo market as one of the central segments of the financial market, which are symptomatic of the entire financial sector as the financial crisis tails off. They reflect the sometimes concurring, sometimes conflicting interests of the various stakeholders and participants. Central banks are, given their monetary policy mandate (and their additional tasks, for instance regarding payments), key market players that can take action even in a crisis. Above all, central banks have a particular interest in ensuring that their monetary stimuli are transmitted to the real economy effectively.

Financial transaction tax endangers interbank liquidity transfer

The planned financial transaction tax puts the role of the repo markets at risk. Governments have two objectives in using the financial transaction tax. As a steering tax, it is hoped that this measure will restrict transactions and place a burden on those market participants that the general public considers to be responsible for distortions in the financial sector. As a fiscal tax, it is intended to increase tax revenue. However, a financial transaction tax on repo transactions would make such transactions unprofitable for banks. The most obvious and much more attractive alternative for banks would be to take up loans from the central bank, which would then become a liquidity manager for the banking system. From both a monetary policy and a regulatory perspective, it would not be desirable for prohibitively high taxation *de facto* to eliminate interbank liquidity distribution via the repo markets and instead force the Eurosystem to assume this role with its monetary policy instruments.

Central bank must not act as liquidity provider of last resort on a regular basis

The variability of haircut and margin requirements in the financial cycle could also increasingly push central banks into the role of a central intermediary. If a large proportion of a bank's balance sheet assets that can be used as

collateral is financed via repo transactions and the lending value of these securities falls abruptly, the central bank could be forced into the role of a liquidity provider of last resort.

The growing importance of CCP clearing could also have an impact on central banks. During the financial crisis, the number of international participants on trading platforms such as Eurex Repo GC Pooling grew sharply. The current financial crisis has shown how large, well established financial market participants can also be hit by illiquidity or insolvency. Central financial market infrastructures with growing importance thus have to be protected from the default of large financial institutions without central banks having to step in as liquidity providers of last resort.

Other regulatory intervention measures in the repo markets could also drive banks out of the market and into the central bank's arms, thus hampering it in the conduct of its monetary policy tasks. Liquid repo markets for non-eligible liquid assets can help financial institutions to meet regulatory liquidity requirements. If parts of the repo markets become illiquid, banks could increasingly seek central bank loans to comply with liquidity requirements. Yet the aim of regulation is that banks comply with regulatory liquidity requirements using their own resources and not by taking up central bank loans.

The trend towards secured money market operations also has an impact on monetary policy. There is very little supply and demand for unsecured money market loans with longer maturities. As they are not collateralised, they would be considerably more expensive than repo transactions and would be of interest predominantly to borrowers who do not have adequate marketable securities. However, no institution is likely to divulge such information willingly. By offering a broad collateral framework that includes far more than just marketable securities, the Eurosystem exposes itself to demand for liquidity from those institutions in

Banks must meet regulatory liquidity requirements using their own resources

Demand for liquidity from institutions with no more unused marketable securities

particular that no longer have an adequate amount of unused marketable securities. They are therefore prepared to pay the Eurosystem the key interest rate, which is currently considerably higher than the repo rates for marketable securities.

In recent years, the repo markets, which are of key importance for the central bank, have

undergone, and are still undergoing, great change – driven by market developments, responses to the crisis and regulatory measures. These developments can have far-reaching repercussions for the central bank at a number of junctures. It is thus very much in central banks' interest to monitor activities on the repo markets more closely and gain a better understanding of them.

*Far-reaching
repercussions
for the central
bank*