

## Implications of the Eurosystem's monetary operations during the financial crisis

*During the course of the financial and sovereign debt crisis the quantity, quality and character of the Eurosystem's monetary policy refinancing operations, which are the core instruments used for steering short-term interest rates in the money market, changed significantly. Since the autumn of 2008, the Eurosystem has granted banks loans in the desired volumes at a fixed interest rate (fixed-rate full allotment procedure). Moreover, the Eurosystem has occasionally made these funds available to banks with – in some cases – very long maturities. These non-standard measures reflect, inter alia, the ECB Governing Council's endeavours to ensure that the prerequisites for both the supply of credit and monetary policy transmission were fulfilled, even at the height of the financial crisis, and, given the sharp recession that subsequently ensued in 2009, to combat the threat of a broad-based credit crunch. However, these and other crisis-induced changes in the use of instruments for steering money market rates constitute a precedent. The Eurosystem is no longer merely steering liquidity and interest rates in the interbank money market: it is taking part in the funding of banks, its influence even extending to capital market maturities.*

*The short-term stabilisation effects of the non-standard measures have been achieved at the expense of side-effects which gain in significance the longer the non-standard measures are used. The long-term provision of funds and fixed-rate full allotment in refinancing operations combined with the lowering of the credit quality threshold for eligible assets and the narrowing of the interest rate corridor reduce the incentive for the banking and financial system to make much-needed adjustments, and so tend to delay normalisation in the interbank money market. Over time, the collective effect of the various measures is to crowd out a part of private money and capital market activity, to limit the disciplining of credit institutions by market forces and ultimately to distort competition between commercial banks.*

*The Eurosystem will not continue indefinitely to provide commercial banks with a generous supply of funding which the banks themselves often cannot obtain in the market at similar conditions. There is at present no indication that the non-standard measures introduced in response to the crisis will be discontinued. Looking to the future, however, it would be desirable if participants in monetary policy refinancing operations also had access to the interbank money market as a matter of principle. Moreover, money market transactions and liquidity-providing monetary policy operations need to become, from the institutions' perspective, at least approximate substitutes. On the path to reverting to a method of steering money market rates that is more in line with the market, the Eurosystem will sooner or later have to improve incentives for money market activity, limit the allotment volume for liquidity-providing operations and bring the credit standards and haircuts for eligible marketable assets into line with market practice.*

*The assessment of banks' balance sheets, which is currently being carried out before the ECB assumes responsibility for the Single Supervisory Mechanism, will support the normalisation of banks' refinancing behaviour and bolster confidence on the money and financial markets. In the process, weaknesses may and must be revealed in the balance sheets of the institutions being examined, the need for action identified and decisions prepared regarding necessary capital measures or, if applicable, the resolution of institutions.*

## Monetary policy stance, conduct of monetary policy and the market conformity requirement

*Decisions about key interest rate and implementation of monetary policy*

Whereas in the early years of monetary union the general public mainly only took note of the ECB Governing Council's interest rate decisions, decisions about the conduct of monetary policy likewise met with public interest following the onset of the financial crisis. Since the liquidity crisis began, the Eurosystem has repeatedly emphasised the conceptual separation of these two decision-making levels – first, with decisions on the appropriate monetary policy stance, notably the key interest rate, and second, on the selection and design of liquidity operations in the context of implementing the monetary policy stance –, referring to it as the “separation principle”.<sup>1</sup>

*Additional liquidity-providing measures ensure that monetary policy stance takes effect*

At the heart of this principle lies the idea that crisis-induced non-standard liquidity-providing measures which are implemented in the context of steering money market interest rates should not be seen as monetary policy easing as an end in itself. Instead, their aim should be for the monetary policy stance that is set by the ECB Governing Council and transmitted through the financial system to have an impact on the real economy – ie the consumption, saving and investment decisions of households and firms. Following on from this idea, even in the presence of non-standard monetary policy measures the monetary policy stance decided by the Governing Council is reflected by the main refinancing rate, the most important of the Eurosystem's three key interest rates, in particular.<sup>2</sup>

*Steering money market rates: core element in implementing monetary policy*

In implementing monetary policy, the Eurosystem has at its disposal the instruments specified in the Treaty on the Functioning of the European Union (TFEU) and the statute of the ECB. The instruments for steering short-term interest rates in the money market are described in more detail in the so-called General Documentation,<sup>3</sup> which is supplemented by the monet-

ary policy decisions which the Governing Council takes at regular intervals.

The aim behind steering short-term interbank money market rates is to ensure that they are in line with the monetary policy stance set by the Governing Council. The main purpose of monetary policy refinancing operations in the euro area is to influence the banking system's liquidity position vis-à-vis the Eurosystem, which is to say the aggregate volume of commercial banks' balances with the Eurosystem's national central banks. This makes it possible to steer short-term interest rates in the interbank money market, in which commercial banks trade central bank balances with one another.

The Eurosystem's monetary policy action must be geared to the primary objective of price stability at all times. Moreover, the Eurosystem is expected to support the general economic policies in the EU, provided that is possible without prejudice to the price stability objective. However, the Eurosystem is subject to fundamental restrictions. For example, it is expressly forbidden for the Eurosystem to buy government bonds on the primary market or to grant loans to general government (monetary financing prohibition). Furthermore, in conducting monetary policy the Eurosystem is required to act “in accordance with the principle of an open market economy with free competition”,

*Liquidity operations a means of steering short-term interest rates*

*Monetary policy safeguards price stability and is consistent with the treaties of the EU*

<sup>1</sup> See ECB, The Eurosystem's open market operations during the recent period of financial market volatility, ECB Monthly Bulletin, May 2008, pp 89-104; J Stark, Growth and productivity of the financial sector: challenges for monetary policy, speech by Jürgen Stark, member of the Executive Board of the ECB, High-Level BCL Policy Panel Luxembourg, 12 November 2008; J-C Trichet, Interview by the newspapers Postimees, Hospodárske noviny and Delo with ECB President Jean-Claude Trichet, 13 July 2011, published on 19 July 2011; J-C Trichet: Interview by Helsingin Sanomat and Kauppalehti with ECB President Jean-Claude Trichet, 20 April 2011, published on 26 April 2011; J-C Trichet, Remarks at the farewell event, speech by ECB President Jean-Claude Trichet, Frankfurt am Main, 19 October 2011.

<sup>2</sup> See L Papademos, Tackling the financial crisis: policies for stability and recovery, speech by Lucas Papademos, Vice-President of the ECB, Annual Dinner of the Society of Business Economists, London, 11 February 2009.

<sup>3</sup> See ECB, The implementation of monetary policy in the euro area – General documentation on Eurosystem monetary policy instruments and procedures, 2011.

promoting an efficient allocation of resources.<sup>4</sup> This principle also applies to the interaction of central banks with commercial banks and is a guiding principle in designing monetary policy regulations and instruments. Monetary policy should be as closely oriented to the market economy and free competition as possible, whereas interventionist designs of monetary policy instruments are exceptions requiring specific monetary policy justification.

*Steering of money market rates should not alter allocation of resources*

For the Eurosystem, to act in accordance with the principle of an open market economy with free competition is not an end in itself, but serves the purpose of favouring an efficient allocation of resources. Against the background of this fundamental principle, the implementation of monetary policy can be considered to be in conformity with the market if the general level of interest rates is steered effectively – thereby safeguarding price stability provided the monetary policy stance is suitably determined – while simultaneously relative prices (interest rates or interest rate spreads) and the allocation of resources through the market are changed as little as possible. For instance, the main determinants of repo interest rates – which include the type, credit quality and market liquidity of the collateral used, the credit standing of the counterparties involved, the relationship between the repo rate and the desired loan amount, as well as the maturity of the transactions – should continue to play a part in determining banks' funding costs. If possible, these mechanisms should be effective even when banks make use of central bank loans.

*Aligning the steering of money market rates with market economy principles*

This article discusses how the Eurosystem's operations for steering money market rates were organised before and during the course of the financial crisis in terms of this market economy principle. It also examines proposals for the design of monetary operations in a post-crisis setting.

## Fundamentals of how the Eurosystem steers money market rates

The Eurosystem's most important instruments for steering short-term interest rates in the money market include the monetary policy refinancing operations – main refinancing operations (MROs) and longer-term refinancing operations (LTROs) – and the standing facilities (deposit facility and marginal lending facility).<sup>5</sup> Through its counterparty policy and the collateral framework, the Eurosystem stipulates which credit institutions may take part in monetary policy operations and the collateral eligibility requirements they have to meet.

*Toolbox for steering money market rates*

## Refinancing operations

In the past, the euro-area banking system consistently showed a structural liquidity deficit vis-à-vis the Eurosystem. In other words, there was a high aggregate need for liquidity-providing monetary policy operations which was covered, for the most part, by central bank loans that were offered on a revolving basis: the monetary policy refinancing operations. These are intended both to steer liquidity and interest rates in the market and to provide signals regarding the monetary policy stance. The once-weekly MROs play a pivotal role in this connection. The minimum bid rate or fixed rate that applies to these operations is the most important of the three key interest rates. On the other hand, the Eurosystem generally does not use LTROs – which normally feature a maturity of approxi-

*Main refinancing operations: signalling monetary policy stance*

<sup>4</sup> See Article 127.1 of the TFEU.

<sup>5</sup> Moreover, there exists in the euro area a minimum reserve requirement for credit institutions, which fulfils an important operational and technical function in steering money market rates, but because it does not pose any problems in terms of the market conformity requirement, it is not featured prominently in this article for reasons of simplicity. The same applies to liquidity-absorbing or liquidity-providing fine-tuning operations (mostly with a maturity of one day) which for a long time were offered on the last day of every maintenance period. Other instruments, such as securities purchases for monetary policy purposes and so-called structural liquidity operations through outright purchases, are disregarded in this article.

## Underlying conditions and principles of how central banks steer money market rates

### Steering money market rates

The major central banks of western countries steer money market rates in ways that sometimes differ quite markedly – in line with the distinctive features of their own financial systems as well as differing national customs and practices.

In English-speaking countries, for example, recourse to central bank loans was traditionally associated with a considerable stigma for banks. A commercial bank that had to take out a loan from the central bank ran the risk of being seen as not very sound – and of losing the confidence of its counterparties and, possibly, of its customers, too. This stigmatisation of recourse to central bank credit was reflected in the way the central banks concerned steered money market rates – for example, the fact that the aggregate liquidity requirements of the banking system were predominantly covered by the central banks' securities holdings or that liquidity operations were reserved for a limited group of the central bank's counterparties, which, in turn, assumed the function of safeguarding the horizontal distribution of liquidity within the banking sector through money market transactions.

### Balance sheet structure of the central bank and the absolute interest rate level

The structure of central banks' balance sheets as well as the absolute level of interest rates are also important underlying factors determining the precise way in which they steer money market rates. For example, the banking systems in countries

where central banks have also purchased large amounts of securities over the past few years in pursuance of their monetary policy objectives now show a liquidity surplus vis-à-vis the central bank in most cases. This takes the form of high central bank balances, while key interest rates are actually or approximately zero (eg Denmark, Japan, Switzerland, United Kingdom, United States). The need for regular liquidity-providing credit operations by the central banks is virtually non-existent in these countries and hardly any use is made of credit operations or the available credit facilities. The excess liquidity held by the banks on their accounts with the central banks often remain unremunerated as far they do not yield a slightly positive rate of interest (USA) or, in fact, draw a marginally negative rate (like in Denmark until April 2014). Short-term interest rates on the interbank money market are then guided by these very low key interest rates that apply to excess central bank liquidity.

### Liquidity management and money market rates

Given fairly high rates of inflation and growth, the key interest rates of most of the major central banks remained well in the positive range up to the financial crisis. Within the terms of the particular way in which they steer money market rates, central banks usually aimed to anchor short-term money market rates for interbank trading close to an interest rate level set by the central bank monetary policy decision-making body. One particularly important factor in linking short-term money market rates closely to the key interest rate is a comparatively precise management of the

banking system's aggregate liquidity position vis-à-vis the central bank, which can be gauged by the banks' overnight balances at the central bank.

### **Fluctuations in the autonomous factors offset by liquidity operations**

Autonomous factors – comprising, in particular, cash in circulation and government deposits at the central bank – are key determinants of the banking system's liquidity position.<sup>1</sup> The central banks' liquidity operations usually offset the changes in the autonomous factors (creation of balanced liquidity conditions) and thus enable the central bank to stabilise and steer the short-term interest rates. The structural liquidity requirements of the banking system, ie the (net) sum of the necessary liquidity-providing monetary policy operations, otherwise merely reflect the structure and composition of the central bank's balance sheet.

The central bank can fundamentally influence the banking system's liquidity position by means of liquidity-providing and liquidity-absorbing monetary policy operations. For example, the central bank can provide the banking system with liquidity by means of revolving loans or by outright purchases of securities. It can withdraw liquidity from the banking system, say, by selling securities, which leads to a reduction of banks' holdings at the central bank. Further possible methods of absorbing liquidity (ie to reduce banks' overnight deposits at the central bank) are, for instance, the collection of remunerated fixed-term deposits from the banks and the central bank issuing its own debt instruments.

### **Commercial banks' current account holdings at central banks**

Commercial banks' current account holdings at the central banks play an important role in the financial system, as a significant volume of payments are settled through them. The commercial banks must, as a general rule, have positive holdings or a balance of at least zero on these current accounts. Mostly, however, intraday overdrafts are possible in the context of payment transactions against the posting of sufficient collateral, and most central banks offer their counterparties the possibility of transferring negative account balances at the end of the day into a kind of overnight overdraft facility, for which, however, higher rates of interest are generally charged. Some central banks additionally require commercial banks to maintain minimum reserves on their current accounts at the central bank, which then produce regular positive balances on those accounts. Non-compliance with a reserve requirement is typically subject to subsequent sanctions in the form of penalty interest.

If central banks aim to control short-term money market interest rates, they must provide in aggregate at least as much in central bank reserves through liquidity operations for the commercial banks' accounts at the central banks to amount in sum to at least zero and, additionally, fulfil any minimum reserve requirements that may exist. Otherwise, money market rates may rise in an uncontrolled way. If, however, the banks' holdings at the central bank are clearly higher than is required in aggregate, the overnight interest rate in the interbank money market can, in principle, go down to

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<sup>1</sup> Especially in the short term, the autonomous factors cannot be influenced by the central banks and are therefore regarded as exogenous in the context of liquidity management by the central banks.

zero. The central bank can take precautions against both eventualities in order to limit fluctuations in short-term money market rates (standing facilities).

### Adjustment function of the money market

Commercial banks' account holdings at the central banks fluctuate in the course of and as an outcome of banking business activity – consisting, for example, of payments, the collection of deposits, and the sale and acquisition of securities. Offsetting these fluctuations is the key role of the interbank money market, which ensures horizontal liquidity adjustment within the banking system. At the aggregate level, banks can make use of central bank loans as a substitute for horizontal liquidity adjustment between banks only to the extent that the central bank offers this possibility to them

on an exceptional or a regular basis – provided the banks satisfy the required approval criteria. If this is the case, the central bank's balance sheet is extended beyond what is necessary and the central bank takes on a part of the intermediation process between the commercial banks.

mately three months – as a means of signalling its monetary policy stance.

## Standing facilities and interest rate corridor

*Deposit facility: lower bound on short-term interest rates in the interbank money market*

When, at the end of a business day, banks have excess current account holdings with the Eurosystem, they can place these funds "overnight" in the deposit facility. They normally receive a positive rate of interest on these funds – the deposit facility rate, which the Governing Council sets as one of the three key interest rates and is usually considerably lower than the minimum bid rate (or fixed rate) on MROs. Simply put, it is only worthwhile for banks to resort to the deposit facility if they are confident that they will be able to fulfil their minimum reserve requirement in the current maintenance period and if they cannot find any interbank money market counterparties that are in need of liquidity and are prepared to pay them an inter-

est rate which, after deduction of any risk premium, is higher than the Eurosystem's deposit facility rate.

If, on the other hand, banks need additional liquidity at the end of a business day in order to balance their current account with the central bank or to meet their minimum reserve requirement, they can – on their own initiative and against the necessary collateral – use the Eurosystem's marginal lending facility (for which there are, as a rule, no credit limits or other restrictions). To do so, they must pay the marginal lending rate. This, the third of the Eurosystem's key interest rates, is usually considerably higher than the MRO rate and the overnight rates on the interbank money market. The reason for this spread has to do with incentives: the marginal lending facility should neither obstruct the function of the interbank money market for the horizontal distribution of liquidity within the banking system, nor should it take the place of refinancing operations in

*Marginal lending facility: upper bound on short-term interest rates in the interbank money market*

covering the banking system's aggregate liquidity deficit. Thus, banks will consider using the marginal lending facility, in particular, in the event of an error in the management of funds or unexpected liquidity outflows at the end of a business day or, more generally, in situations in which a bank has unintentionally exhausted all other, less expensive sources of liquidity.

*Interest rate corridor: stabilising money market and liquidity conditions and encouraging money market activity*

The signals given through the MRO rate about the monetary policy stance are complemented by the marginal lending rate and the deposit facility rate. The interest rate corridor between these two rates limits fluctuations in short-term money market rates, thereby protecting banks, within certain bounds, from being forced into transactions with very unfavourable conditions by other banks that occupy a stronger position in the interbank money market. In this way, the standing facilities help stabilise money market and liquidity conditions, even when they are not used by banks. The width of the interest rate corridor plays a large part in determining the incentives for money market activity, ie the horizontal distribution of liquidity between banks through the interbank money market.

## Equal treatment of financially sound counterparties

*Eligible counterparties and collateral framework*

The eligibility criteria for counterparties within the monetary policy framework are such that a broad range of institutions is given access to Eurosystem monetary policy operations and equal treatment of institutions is enhanced throughout the euro area. The authorised institutions must be financially sound. Individual counterparties may be denied access to monetary policy operations on the grounds of prudence. A more moderate option open to the Eurosystem is to refuse, or limit the acceptance of, certain counterparties' collateral. Generally speaking, counterparties may be excluded, in particular, if they fail to meet basic regulatory requirements, for instance with regard to capital adequacy, and cannot therefore be considered financially sound.

The Eurosystem requires its counterparties to provide "adequate collateral" (see Article 18.1 of the Statute of the ECB) for liquidity-providing monetary policy operations – in particular, refinancing operations and the marginal lending facility – as well as for intraday credit needed to settle payments. In practice, the Eurosystem accepts a wide range of marketable and non-marketable assets (in particular, interest-bearing securities and credit claims). Essentially, the eligibility criteria for assets have been harmonised throughout the euro area. The main purpose of the collateralisation of the Eurosystem's credit operations is to protect it from financial risks in the event of default by monetary policy counterparties. Moreover, haircuts are applied primarily on the basis of the rating (or, in the case of credit claims, a rating equivalent) and additionally, in the case of marketable securities, according to the Eurosystem's liquidity category for a specific type of security.

*"Adequate collateral" to protect the Eurosystem from financial risks*

It is not the purpose of the monetary policy refinancing operations and the collateral framework to establish an independent credit policy of the Eurosystem. The principle of an open market economy with free competition obliges the Eurosystem to be neutral with regard to the accepted collateral. This means that the criteria for the acceptance of collateral and the calculation of haircuts are based, as a general principle, on risk criteria (credit risk, market liquidity of the collateral). The stipulation that collateral must be "adequate" represents minimum requirements for the credit quality and unhindered realisability of the accepted collateral, requirements which must not be undershot. However, the Eurosystem is at liberty to adjust the credit quality threshold upwards on the basis of monetary policy considerations. As a general principle, the Eurosystem is under no obligation to refinance certain claims or securities through revolving credit operations.

*No credit policy through the collateral framework*

## Monetary operations prior to the financial crisis

### Design of the instruments

*Before the financial crisis: limited allotment volume and variable-rate tender procedure*

Up until the outbreak of the financial crisis in September 2008, the Eurosystem conducted the weekly MROs as competitive tender operations with a limited allotment volume. From June 2000, it made use of a variable-rate tender procedure, in which the minimum bid rate for the bids submitted acted as the “key interest rate”. From the introduction of the euro in January 1999 until the summer of 2007, the Eurosystem conducted monthly LTROs with a maturity of around three months to provide an average of roughly one-quarter of the outstanding refinancing volume. From the outset, the Eurosystem used variable-rate tenders without a minimum bid rate for LTROs, as it did not wish to signal its monetary policy stance through these operations.<sup>6</sup>

*Variable-rate tender procedure: amount allotted to each bidder depends on the interest rates bid*

To improve the prospects of being allotted the desired amount of central bank credit in the variable-rate tender procedure, banks have to bid higher interest rates, which they then have to pay if the bid is successful. Under this “American auction” procedure, it is in the bidders’ own interest that they do not submit excessively high bids. The average interest costs (weighted average allotment rate) of the rates at which bids are satisfied usually lie above the marginal allotment rate, but do not substantially exceed it under normal circumstances.

*Variable-rate tender procedure encourages market-oriented behaviour by banks*

When competitive bidding procedures such as the variable-rate tender procedure are used, the individual bidders can never be completely sure – given that the allotment volume is limited and not knowing the other banks’ bids – whether and in what amount their bids will be successful. Normally they have to resort to the interbank money market for any funds they are unable to obtain. In the context of the variable-rate tender procedure with limited allotment amounts, it is therefore important that banks maintain market access to be able

to refinance themselves at favourable terms on the money market.

Individual institutions which are unable under these conditions to obtain the liquidity they need either in the market or through the regularly conducted monetary policy refinancing operations have to turn to the marginal lending facility. Throughout the period from April 1999 to the beginning of October 2008 the interest rate corridor between the rates for the marginal lending facility and the deposit facility was symmetrical around the MRO rate, with a width of  $\pm 100$  basis points (bp).

*Symmetrical interest rate corridor with a width of  $\pm 100$  basis points*

### Market conditions and the results/effects of the monetary operations

It can be assumed that the overwhelming majority of euro-area banks had sustainable access to the interbank money market from 1999. The institutions considered credit transactions with each other to be largely risk-free. This is suggested, *inter alia*, by the – for long periods – virtually constant and very small spreads between unsecured and secured money market rates.<sup>7</sup> As a rule, banks traded central bank balances with a limited number of counterparties. The interbank money market was characterised by stable network structures and by a relatively small number of banks that assumed a particularly important role in liquidity distribution.<sup>8</sup> The refinancing operations involving a limited allotment volume that were offered under the variable-rate tender procedure combined with the wide interest rate corridor to produce the fol-

*Broad and sustainable access for banks to the interbank money market*

<sup>6</sup> Under the variable-rate tender procedure, bids are submitted stating the desired amounts and interest rates. Taking the individual bids submitted, the Eurosystem draws up a list of bids in descending order of the offered interest rates until the allotment volume is precisely exhausted. The lowest interest rate at which amounts are allotted is referred to as the “marginal allotment rate”.

<sup>7</sup> In retrospect, banks’ risk perception prior to the financial crisis may appear inadequate.

<sup>8</sup> B Craig and G von Peter, Interbank tiering and money center banks, Deutsche Bundesbank Discussion Paper No 12/2010.



lowing liquidity and money market conditions from the time the euro was introduced until the financial crisis broke out.

*Balanced liquidity conditions: virtually no excess liquidity*

- Through its monetary policy refinancing operations the Eurosystem provided, on the whole, precisely sufficient liquidity to ensure that the banking system's aggregate liquidity needs per maintenance period – which consist of the autonomous factors (see the box on pages 40 to 42) and the minimum reserve requirement – were covered. The average level of excess liquidity per maintenance period, which can be measured in terms of average recourse to the deposit facility plus the banks' current account holdings with the Eurosystem in excess of the reserve requirement, was extremely low compared with the outstanding refinancing volume or reserve requirement.

*Wide corridor provides incentives for private money market activity*

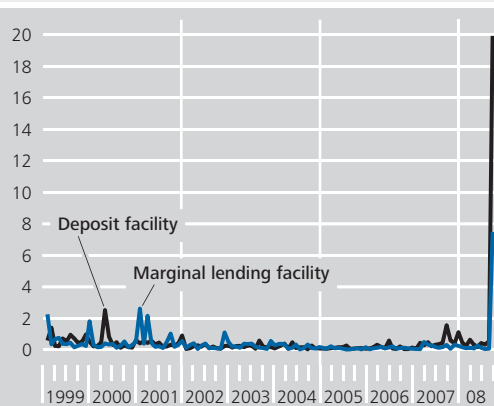
- The interest rate corridor with a width of  $\pm 100$  bp provided strong incentives for private money market activity, and thus safeguarded the horizontal distribution of liquidity through the interbank money market. Before the collapse of Lehman Brothers the volume of recourse to the deposit facility and marginal lending facility as a long-term average over the maintenance periods was less than €1 billion in each case (see the above chart); this was only a tiny fraction of the refinancing volume or reserve requirement. In a nutshell, banks did not make systematic use of the standing facilities until the height of the financial crisis.

*Effective steering of short-term interest rates*

- On balance, the Eurosystem succeeded in steering short-term money market rates effectively. With regard to the mean deviations of the short-term money market rates from the key interest rate as well as their fluctuations, for quite some time the Eurosystem was at least as successful in this respect as other major central banks. The Eurosystem's steering of money market rates sometimes served as a role model for other central

### Deposit facility and marginal lending facility

Average recourse per maintenance period in € billion



Sources: ECB and Bundesbank calculations.  
 Deutsche Bundesbank

banks wishing to enhance their own operations for steering money market rates.<sup>9</sup>

One side-effect of using refinancing operations with limited allotment amounts to steer short-term interest rates was that the total assets reported in the consolidated financial statement of the Eurosystem were no greater than necessary, taking as given the prevailing level of autonomous factors and the reserve requirement. Thus, limited allotment amounts contributed to keeping the financial risks assumed by the Eurosystem and the associated redistribution effects confined to a relatively small scope during the time before the financial crisis.

*Limited allotment amounts: mitigating financial risk*

### Liquidity crisis: harbinger of the financial crisis

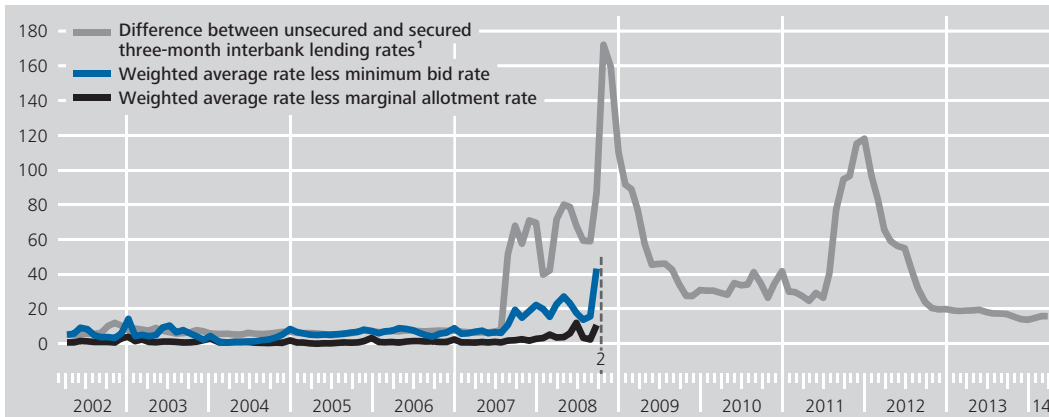
In the run-up to the financial crisis the variable-rate tender procedure proved capable of adapting to changing market conditions. The strong demand by banks which grew increasingly dependent on their successful participation in monetary policy refinancing operations caused an increase in the weighted average rate on

*Allotment rates of the variable-rate tender procedure point to money market tensions ...*

<sup>9</sup> See D Nautz and J Scheithauer, Monetary Policy Implementation and Overnight Rate Persistence, *Journal of International Money and Finance*, Vol 30 (7), 2011, pp 1375-1386.

### Money market risk premium and tender rates in main refinancing operations

Basis points



Sources: ECB and Bundesbank calculations. **1** Three-month EURIBOR less three-month EUREPO. **2** Since 15 October 2008, the weekly main refinancing operations have been conducted as fixed-rate tenders with full allotment.

Deutsche Bundesbank

MROs (in relation to the minimum bid rate) from the onset of the liquidity crisis in August 2007. The spread between the weighted average rate and the marginal allotment rate likewise widened over time. The widening of this interest rate spread points to a decline in the uniformity of interest rates in the interbank money market during that time, and can be seen as a stress barometer for the interbank money market in the same way as the increase in money market risk premia<sup>10</sup> (see the above chart).

... and replicate, at least partly, the disciplining effect of market forces

Thus, the American-style variable-rate tender procedure ensured that, before the financial crisis, banks' funding costs with the Eurosystem reflected at least to some degree the divergence between the short-term funding costs of sound and less sound banks in the market. Generally speaking, therefore, this procedure can be considered largely in line with market conditions: banks whose market access deteriorates are forced to bid more aggressively in refinancing operations. As a result, their marginal funding costs with the Eurosystem increase, as does the willingness of banks to pay higher rates of interest for money market loans. In this way, the variable-rate tender procedure gives banks a certain incentive to implement, on their own initiative, confidence-building measures – such as strengthening their capital

base or reducing the extent of their maturity transformation – in order to maintain their access to the money market.

The growing pressure on the interbank money market in the euro area in the course of the liquidity crisis<sup>11</sup> was also reflected in rising interest rate spreads between unsecured and secured money market operations. It grew increasingly difficult to conclude unsecured money market transactions, particularly in longer maturities, and on the repo market there was a growing trend towards accepting only higher-quality collateral.<sup>12</sup> This presented a challenge to the Eurosystem's steering of money market rates in that, given market participants' increasing risk awareness, unsecured money market rates such as EURIBOR showed an upward tendency in relation to the key interest rate. Doubts as to the controllability of short-term money market rates by the Eurosystem seemed to grow as a result. However, alternatives to the variable-rate tender procedure

*Increase in money market risk premia – problematic for the monetary policy signal?*

<sup>10</sup> See P Abbassi and D Nautz, Monetary transmission right from the start: On the information content of the Eurosystem's main refinancing operations, *North American Journal of Economics and Finance* 23 (2012), pp 54-69.

<sup>11</sup> See ECB, The Eurosystem's open market operations during the recent period of financial market volatility, *op cit*.

<sup>12</sup> See Deutsche Bundesbank, The financial system in transition: the new importance of repo markets, *Monthly Report*, December 2013, pp 57-71.

– such as full allotment in refinancing operations – cannot, at least, improve the clarity of the monetary policy signal given the respective state of the interbank money market, and may even make it worse. With regard to the effectiveness of monetary policy and the appropriate monetary policy stance, rising money market risk premia can in any case generally be compensated by cuts in the key interest rate if, otherwise, there are reasons to fear an undesired tightening of monetary policy. The Eurosystem's two-pillar strategy<sup>13</sup> provides a coherent framework to enable this to happen.

tober, MROs would be conducted as fixed-rate tenders with full allotment. This arrangement was subsequently extended to include LTROs as well. Moreover, on 9 October 2008 the interest rate corridor between the rates for the Eurosystem's marginal lending facility and deposit facility was narrowed from  $\pm 100$  bp to  $\pm 50$  bp around the main refinancing rate (the previous minimum bid rate on MROs). This measure was set to run until 20 January 2009. And finally, on 17 October 2008, the rating threshold for eligible collateral was lowered from A- to BBB- with effect from 22 October.

*Institutions' money market access increasingly varied*

One factor that helped to escalate tensions prior to the financial crisis was that, in line with heightened risk awareness, different banks increasingly had to pay different interest rates on the money market. Fewer and fewer banks were able to procure liquidity on the interbank money market in the previously accustomed amounts at (reference) interest rates like EURIBOR. In addition, access to the interbank money market deteriorated for a growing number of banks, because many institutions – prompted by higher risk awareness – were restricting existing credit lines for other banks or closing them completely. From the individual bank's viewpoint, such risk-mitigating measures are understandable. After all, it is the task of a bank's risk management team to respond to changing risks. On the other hand, it is probable that banks had assessed risks wrongly prior to the liquidity crisis by underestimating them overall.

These decisive non-standard monetary policy measures instantly made central bank loans significantly cheaper for all institutions than the money market rates recorded just a short time before. The full allotment in MROs and LTROs and the strong demand from institutions led to a first surge in excess liquidity from, previously, close to zero to over €200 billion on average in the fourth quarter of 2008. Thus, for the first time since the beginning of monetary union, there was no longer a shortage of banks' current account holdings with the central bank on the whole. Given this excess central bank liquidity, short-term interest rates on the interbank money market fell considerably below the main refinancing rate (see chart on page 48). From that point at the latest, they could no longer be considered representative of banks' marginal liquidity and funding costs: the deposit facility rate represented the opportunity costs associated with banks' own excess liquidity. Some of the banks which still had market access were in a position to satisfy their liquidity shortage at money market rates below the main refinancing rate and above the Eurosystem's deposit facility rate. Those banks which were no longer able or no longer wanted to cover their liquidity and funding needs through the market had to pay the main refinancing

*Surge in excess liquidity and fall in money market rates*

## First phase of the financial crisis 2008-09

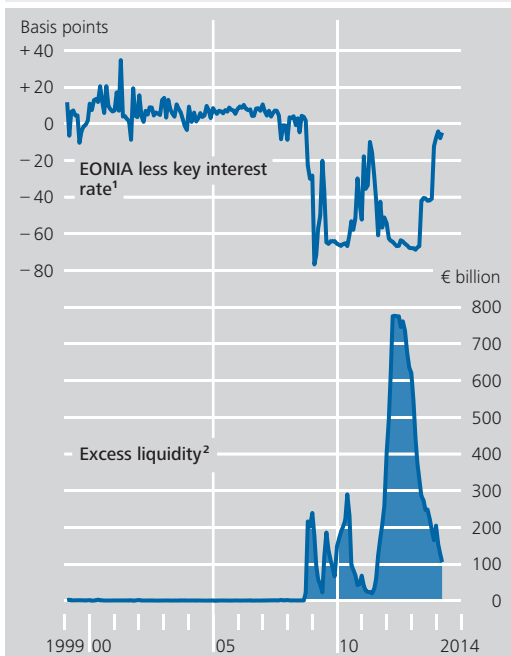
*Non-standard monetary policy measures to stabilise the financial system*

The collapse of the US investment bank Lehman Brothers on 15 September 2008 may be seen as a watershed marking the transition from the liquidity crisis to the financial crisis. The already tense situation in the markets then escalated dramatically. In consequence, the Governing Council decided on 8 October 2008 that, starting from the operation to be settled on 15 Oc-

<sup>13</sup> See ECB, The stability-oriented monetary strategy of the Eurosystem, Monthly Bulletin, January 1999, pp 43-56; ECB, Editorial, Press release of 8 May 2003 on the ECB's monetary policy strategy, Monthly Bulletin, May 2003, pp 5-8.

### Spread between EONIA and the key interest rate and excess liquidity

As an average for each maintenance period



Sources: ECB and Bundesbank calculations. **1** Up until 8 October 2008 minimum bid rate on main refinancing operations, thereafter main refinancing rate. **2** Deposit facility plus current account holdings less minimum reserve requirements.

Deutsche Bundesbank

rate in each case. When the interest rate corridor was expanded again to the previously usual width of  $\pm 100$  bp, the monetary policy refinancing volume and excess liquidity fell sharply. Between 20 January 2009 and 23 June 2009, excess liquidity averaged no more than some €65 billion.

*Non-standard measures counteracted downward spiral in the securities markets*

In this first, critical phase of the financial crisis, the Eurosystem's full allotment policy for refinancing operations had broad-based – and very important – stabilisation effects. They meant that banks whose liquidity situation had grown tense due to the crisis – including, in particular, those institutions that were affected by restrictions in horizontal liquidity adjustment through the interbank money market – largely did not have to dispose of assets in “fire sales” in order to obtain liquidity. This served to counter the possibility of a self-reinforcing downward spiral in securities prices, which could have done far greater damage to the financial sector, indirectly weighing on the real economy

to an even greater extent as a result. Taken together, then, the non-standard monetary policy measures which the Eurosystem implemented in the autumn of 2008 reversed the trend of rapidly rising money market risk indicators (see chart on page 46).

In this respect the effect of the full allotment policy for refinancing operations was, in this phase of the financial crisis, similar to that of numerous liquidity programmes offered by the Federal Reserve to commercial banks and market participants at around the same time. The Eurosystem's broad range of counterparties and the broad collateral framework proved to be beneficial, as they meant that the entire banking system could be provided with liquidity directly. The banking system as a whole was consequently stabilised, and the possible collapse of part of the financial system was averted. It is likely that these measures ultimately also gave a considerable boost to banks' ability to lend – which, of course, is one of the key functions they perform for the real economy – in the months and quarters that immediately followed the collapse of Lehman Brothers.

*Stabilisation of the financial system as a necessary condition for price stability*

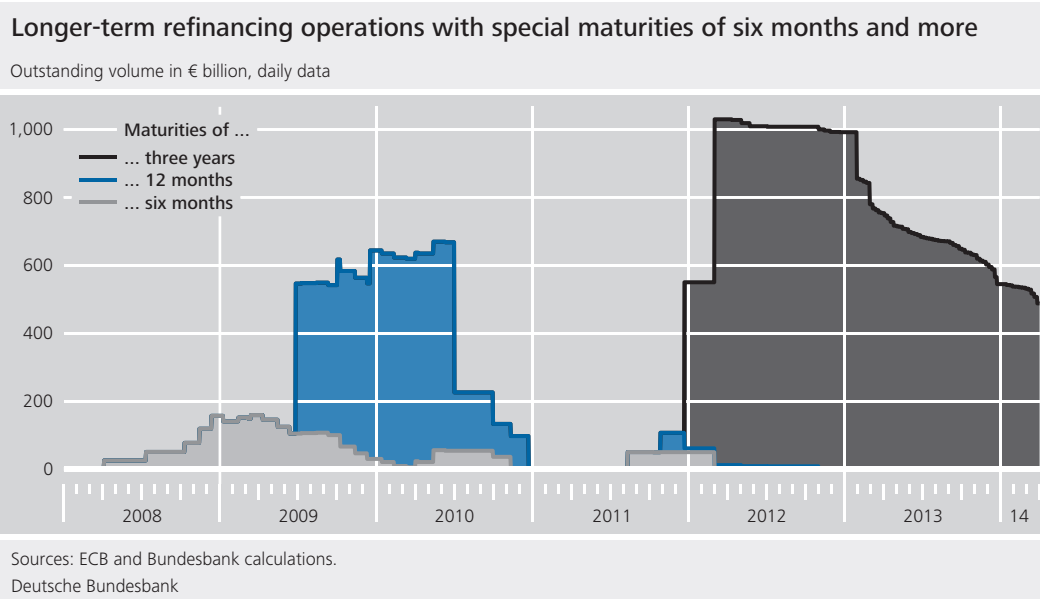
## Long-term refinancing operations during financial and sovereign debt crisis

### Second phase of the financial crisis 2009-10: offer of 12-month tenders

Having already offered, since April 2008, LTROs with a special maturity of six months, the Eurosystem decided in May 2009 to conduct three long-term refinancing operations with a 12-month maturity. These operations, one of the components of the “enhanced credit support”,<sup>14</sup> were carried out at roughly three-

*Enhanced credit support to ward off a credit crunch*

<sup>14</sup> J-C Trichet, The ECB's enhanced credit support, speech by ECB President Jean-Claude Trichet, Ludwig-Maximilians-Universität, Munich, 13 July 2009.



month intervals from 25 June 2009. Particularly the first of these three operations met with massive demand, the bidding and allotment volume totalling €442 billion. Accordingly, the outstanding refinancing volume rose sharply. Excess liquidity having fallen to low double-digit billion euro amounts over the months before, it experienced a strong temporary increase as a result of the extensive participation by banks in the first of the three 12-month tenders. Encouraged by the incentive of the broader interest rate corridor, banks scaled back excess liquidity again in the course of the fourth quarter of 2009, however, by reducing their recourse to refinancing operations with a shorter maturity to well below €100 billion at times.

*Excess liquidity up in the first half of 2010*

Following the allotment of the third 12-month tender in December 2009, excess liquidity again climbed to a level of more than €200 billion on average in the first half of 2010. With hindsight, the following factors may be considered relevant in this respect. The refinancing volume was largely dominated by the three outstanding 12-month tenders, the total volume of which, at more than €600 billion, for a time exceeded the structural liquidity deficit of the banking sector. The total volume of the shorter-term operations was small by comparison. Moreover, the transition from financial

crisis to sovereign debt crisis occurred during this time, and is likely to have increased the demand for liquidity. And not least of all, banks were also building up considerable liquidity buffers to be able to repay the tender amount of €442 billion that was due on 1 July 2010.

On 4 March 2010, the Governing Council stressed its determination to continue the exit from the liquidity-providing non-standard measures. The full allotment policy for the three-month MROs was discontinued, and on 28 April 2010 an LTRO with an indicative allotment volume and a minimum bid rate was again offered in the variable-rate tender procedure for the first time. In terms of market economy principles, the operation was a success. The bidders did not fully exhaust the envisaged allotment volume, while banks, having played safe by bidding very high interest rates because of their dependence on central bank loans, had to pay an interest rate spread averaging 15 bp above the 1.0% minimum bid rate through this form of self-selection. For this reason, the – albeit temporary – return to a variable-rate tender procedure meant a distinct improvement in market conformity compared with the fixed-rate full allotment in the case of the LTROs.

## European sovereign debt crisis after May 2010

*First steps towards exiting non-standard measures discontinued in 2010*

The onset of the sovereign debt crisis in early May 2010 prompted the Eurosystem to unwind the steps it had already taken to discontinue its non-standard liquidity-providing monetary policy measures. The exit process has remained on ice ever since. The Eurosystem has already promised banks that its refinancing operations will be allotted in full until mid-2015.

*Excess liquidity low until sovereign debt crisis escalated in summer 2011*

The uncomplicated and, for the most part, smooth repayment of the €442 billion tender on 1 July 2010 caused excess liquidity to recede suddenly and then decline further to considerably less than €100 billion, before resuming an upward trajectory in summer 2011 on the back of growing pressure in the government bond and bank debt markets in a number of periphery countries. One 12-month refinancing operation conducted at the end of October 2011 still attracted relatively modest demand of €57 billion. The Governing Council then decided at the beginning of December 2011 to offer two more long-term refinancing operations, but this time with terms of roughly three years.

*Three-year LTROs: intervention in yield structure in capital market maturities*

The three-year LTROs were likewise conducted on a full allotment basis, but unlike the 12-month tenders in 2009 they each offered counterparties the option of early repayment after a minimum term of roughly one year. Taken together, the two operations generated a bidding and allotment volume of more than €1 trillion. These measures were decided against the background of the heightened uncertainty observed in the financial markets since August 2011 given the prospect that a large volume of government bonds and bank debt needed to be rolled over in 2012.<sup>15</sup> The three-year LTROs marked the Eurosystem's departure from the money market's maturity spectrum and its first broad interventions in capital market maturities with the types of instruments normally used to steer money market rates.

The three-year LTROs had a very substantial impact on the money market and on the liquidity position of the banking sector. The allotment of the two three-year tenders in late 2011 and early 2012 drove excess liquidity sharply higher in two steps to roughly €775 billion in the second quarter of 2012, and it was only in the course of 2013 – when banks made use of the early repayment option – that volumes began to contract sharply. With the two three-year refinancing operations less than a year from maturity in the first quarter of 2014, the remaining excess liquidity currently amounts to more than €100 billion. It should be noted, however, that the Eurosystem continues to offer weekly liquidity-absorbing operations currently totalling just over €170 billion.<sup>16</sup> Hence, the Eurosystem balance sheet still overshoots by more than €270 billion the level required for balanced liquidity conditions.

*Large-scale persistent increase in excess liquidity to record level*

Money market risk indicators such as the spread between unsecured and secured inter-bank money market rates (known as the depo-repo spread) have diminished steadily since peaking, relatively speaking, around the turn of 2011/2012, not least on account of the large volume of excess liquidity created by the three-year LTROs. The persistent narrow spread of short-term money market rates over the Eurosystem's deposit facility rate was a side-effect of the very high level of excess liquidity. These operations produced, *inter alia*, two major outcomes. First, they substantially relieved the funding situation for ailing banks; second, they stoked demand for paper such as government bonds, which were used for carry trades. At the end of the day, it was by easing funding for banks and sovereigns in the euro-area periph-

*Money market risk premia recede*

<sup>15</sup> See European Central Bank, Introductory statement to the press conference (with Q&A), ECB President Mario Draghi, 5 December 2013.

<sup>16</sup> The Eurosystem offers banks a once-weekly liquidity-absorbing operation in the amount of the outstanding SMP (Securities Markets Programme) portfolio volume. This operation was introduced alongside the SMP in May 2010 to stress that it was not the intention of this programme to loosen monetary policy.

ery that the operations brought about improvements in the money market risk indicators.

*Narrowing interest rate corridor*

The year 2013 saw the main refinancing rate contracting in two further steps from 0.75% to 0.25% of late. So far, the Eurosystem has refrained from introducing a negative deposit facility rate, which has narrowed the interest rate corridor still further. Since November 2013, the spread between the main refinancing rate and the deposit facility rate has been no more than 25 bp.

## Side-effects of the liquidity-providing non-standard monetary policy measures

The high take-up of the fixed-rate refinancing operations, some of which had very long terms, and the at times extremely high levels of excess liquidity illustrate how the Eurosystem, in the first case, on the assets side of its balance sheet, and in the second, on the liabilities side, increasingly intervened in market conditions on balance through the non-standard monetary policy measures it took as the financial and sovereign debt crisis progressed.

## Money and repo market activity impaired

*Repo market: Eurosystem takes the place of market activity for lower quality collateral*

While the repo market was increasingly out of bounds for anything but high quality collateral, the Eurosystem significantly broadened the collateral framework by lowering the general credit quality threshold for eligible collateral from A- to BBB-. The Eurosystem's willingness to lend against riskier collateral tended to primarily benefit banks which had taken on greater funding and credit risk than others and had therefore been hit harder by the general loss of confidence across the markets. Institutions which in retrospect had managed risk less effectively than others ultimately stood to gain more from the Eurosystem's operations and thus succeeded in evading some of the losses

looming over their earnings. By contrast, banks which had funded their lending business in a stable manner with customer deposits and capital market instruments and chose not to use short-term funding for long-dated securities (maturity transformation) as a means of generating interest income tended to reap fewer benefits from the non-standard monetary policy measures.

The initially temporary narrowing of the interest rate corridor on 9 October 2008 in a full allotment regime contributed to preventing short-term money market rates from falling too far below the main refinancing rate. However, full allotment and the narrower interest rate corridor meant that the highest interest margin which banks could generate with excess liquidity in the one-week maturity segment of the money market was limited to the spread between the main refinancing rate (at which banks requiring liquidity could procure Eurosystem funding) and the deposit facility rate (at which banks with excess liquidity could safely invest current account holdings with the Eurosystem), that is to say, to half the width of the corridor of no more than 50 bp.<sup>17</sup> Simply put, this means that whenever the appropriate credit risk premium for a money market transaction between banks was higher than this spread, it made no sense for banks with liquidity surpluses to offer excess liquidity in the money market. This mechanism became more pertinent when the two reductions in key interest rates in 2013 narrowed the interest rate corridor further still. This gave banks less of an incentive to balance their liquidity position horizontally by participating in the interbank market, while the Eurosystem's current policy of conducting once-weekly liquidity-absorbing operations acted as a further substantial hindrance.

*Full allotment combined with narrow interest rate corridor crowds out a part of inter-bank money market activity*

<sup>17</sup> The highest possible interest margin that banks can generate for overnight money market operations is the spread between the marginal lending facility and deposit facility rates, which the narrowing of the interest rate corridor reduced from 200 bp to 100 bp.

*Role played by the interest rate corridor in the decline of excess liquidity*

The manner in which excess liquidity contracts over time after the Eurosystem conducts attractive refinancing operations is dictated to a large extent by the width of the interest rate corridor: a wide interest rate corridor usually encourages banks to reduce excess liquidity of their own accord by participating to a lesser extent in shorter-term refinancing operations (which are normally offered as fixed-rate full allotment operations) as soon as they can procure the funding less expensively in the money market. This diminishes banks' aggregate current account holdings, shortening the central bank's balance sheet. On the other hand, if the spread between the main refinancing rate and the deposit facility rate is too narrow, this can slow the pace at which excess liquidity is returned to the Eurosystem – a phenomenon which is observable at present.

## Competition for funding: deposits and bank debt

*Competition for funding impaired*

The fixed-rate full allotment of long-term refinancing operations (particularly three 12-month tenders in 2009 and two three-year tenders in late 2011/early 2012) facilitated large-scale outflows of bank deposits and other funding resources without forcing the banks in question to counter all these outflows by raising interest rates on deposits and/or procuring money and capital market funding. Thus, the Eurosystem's additional liquidity-providing operations fed through to influence competitive conditions between banks for customer deposits and other sources of funding. Over time, this increasingly caused the long-term central bank loans provided by the Eurosystem to have a funding effect. Each of the long-term refinancing operations constituted an intervention at a specific point of the yield curve (which normally steepens as maturities increase), enabling banks to engage in *quasi*-arbitrage transactions such as replacing their own money/capital market funding with less expensive Eurosystem loans, or acquiring additional securities and

using maturity-matched Eurosystem funding to generate interest income (carry trades).<sup>18</sup>

A partial observation looking at each bank's individual funding costs in the capital market can indicate the extent to which some of the counterparties participating in monetary policy operations inevitably receive preferential treatment. Banks' individual refinancing costs typically diverge strongly as maturities increase. While interest rates on overnight money market transactions between banks domiciled in the euro area are usually only a few basis points apart, yield spreads on three-year bank debt, say, can easily amount to 100 bp or even significantly more, depending on the issuer's creditworthiness. The longer the maturity of the funding instruments which banks use, the greater the divergence in their individual funding costs and, by the same token, the extent to which they are subsidised by long-term Eurosystem loans, which are offered at a uniform fixed interest rate. The subsidy element for a single major commercial bank which substantially participated in the three-year refinancing operations could quite easily amount to more than €100 million over the entire term.

*Cost of market-based financing varies from one bank to the next – subsidy element depends on individual bank*

This is one of the main reasons why the measures which central banks use to implement monetary policy usually focus not on influencing capital market rates for bank debt but on steering banks' marginal liquidity and funding costs in the short-term segment. Interventions in this segment barely alter market conditions, if at all, and the competitive conditions between banks for funding are hardly affected, provided the monetary policy operations are properly designed.

*Steering interest rates in short-term segment barely intervenes in competitive conditions*

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<sup>18</sup> See also Deutsche Bundesbank, Changes in bank holdings of domestic government bonds in the euro area, Monthly Report, November 2013, pp 31-32; as well as Deutsche Bundesbank, Substantial government bond purchases by Eurosystem and commercial banks, Monthly Report, May 2012, p 32.



## High level of excess liquidity and substantial refinancing volume

*Attractiveness of conditions relative to market conditions dictates demand*

The Eurosystem's long-term refinancing operations met with a great deal of demand owing to the full allotment procedure and their very attractive maturities, interest rates and collateral conditions. A number of other factors added to the attractiveness of the long-term refinancing operations, including the zero weighting afforded to government bonds under the capital requirements (for which the Eurosystem is not responsible) and the option of using debt securities retained by issuers as collateral for Eurosystem credit which were marketable but not always liquid. A sudden spike in the volume of central bank refinancing in connection with the provision of additional Eurosystem liquidity operations confirms that from a participating bank's perspective, the central bank's operations are not only more favourable, systematically speaking, than market conditions at the given point in time (eg interest rates for deposits or capital market instruments) but also more attractive than other monetary policy operations.

*Excess liquidity a yardstick for interventions in competitive conditions*

The take-up of these non-standard operations is indicative both of tension levels in the markets and the extent to which the operations alter competitive conditions. If the banking system is experiencing a structural liquidity deficit and monetary policy refinancing operations are used to cover the deficit, the level of excess liquidity is a yardstick for the extent to which banks – and, by extension, the assets they take onto their balance sheets – are supplied with additional liquidity or funded by the central bank. Interventions in competitive conditions through the channel of non-standard liquidity-providing monetary policy measures are justifiable provided they remain strictly within the boundaries of the Eurosystem's mandate and they are maintained no longer than warranted by market conditions.

## How measures impact on competition between institutions

From the perspective of an entity providing liquidity in the interbank money market, the overall impact of the measures reveals that the Eurosystem has deprived banks with excess liquidity of a potential source of income on their liquidity inflows. Ultimately, many banks have attracted inflows of liquidity because investors and market participants have more confidence in them than in other credit institutions. It is reasonable to assume that institutions which saw strong liquidity inflows also tended to be the ones which had a superior capital base and a more robust funding structure, or which engaged in less risky business than other institutions.

As for institutions that haemorrhaged liquidity because they lost the confidence of investors and market participants, say, often combined with a rather imbalanced funding structure and a frail capital base, the fixed-rate full allotment of refinancing operations in an extended collateral regime acted to curtail their interest costs. So in effect, these institutions were afforded preferential treatment by the Eurosystem.

*Sound institutions lose income that would otherwise result from their strong liquidity position*

*Less sound institutions effectively favoured by Eurosystem*

## Summary classification and assessment of measures

Any assessment of the first wave of non-standard monetary policy measures in the immediate aftermath of the Lehman Brothers bankruptcy needs to weigh up two different aspects. First, the downside risks to price stability which might have materialised had the financial system got even more substantially out of kilter, potentially causing a broad-based credit crunch. Second, stabilisation measures inevitably entail costs and risks. There is an innate tension between the non-standard measures and the European Union's market economy principles, although it is worth remembering that the narrowing of the interest rate cor-

*Measures taken in response to the collapse of Lehman Brothers appropriate overall*

ridor to  $\pm 50$  bp was just a short-lived measure, lasting, as it did, only a little over three months. This significantly eased the temporary constraints which the Eurosystem's measures imposed on market economy principles, particularly between early October 2008 and the end of January 2009. Given the potential threat of a severe recession and the attendant downside risks to price stability, it can be concluded that the scale and duration of the measures adopted by the Eurosystem to stabilise the financial system were appropriate overall.

*Some institutions' continued dependence on central bank loans incompatible with market economy principles*

Yet from the perspective of market economy principles, it is problematic if some commercial banks become reliant on the Eurosystem for an extended period of time. This dependence can come about in two different ways. First, if the institutions are unable to obtain liquidity or funding from any other commercial bank – either on an unsecured basis or against liquid collateral – no matter what interest rate they are prepared to pay (they are shut out of the money and capital market). Save for the non-standard liquidity-providing monetary policy measures, these institutions would face the acute risk of illiquidity. Second, a commercial bank can be dependent on central bank loans if its own funding costs in the market are so high that a stream of net interest losses would drive it into overindebtedness and ultimately insolvency. Banks that are persistently reliant on central bank loans should normally, by rights, exit the market because they have lost the confidence of the markets, cannot safeguard their funding and have failed in their core duties of managing credit and liquidity risk.

*Opportunistic use of refinancing operations*

By contrast, institutions may be described as using central bank loans opportunistically if they are theoretically able to tap the markets for funding but the conditions offered by the central bank are simply less expensive than market conditions. The opportunistic use of central bank loans – first and foremost the long-term refinancing operations – in the broader sense of the term is an equally undesirable state of affairs: in this case, monetary pol-

icy enables banks – and, by extension, their shareholders – to mine a potentially rich seam of earnings on a scale which is not available to entities that are shut out of the central bank's refinancing operations, such as insurers and non-financial corporations. These potential earnings streams include the aforementioned carry trades – purchasing government bonds and using them as collateral in monetary policy refinancing operations – which do not require banks to comply with large exposure limits or necessarily hold capital against them. If the central bank offers long-term refinancing operations of this kind, commercial banks differ from non-banks inasmuch as they can fund their business operations using central bank loans at the key interest rate for the sole reason that they hold eligible collateral as assets or can create it as part of their business operations and besides, only banks are authorised participants in the central bank's liquidity operations.

In practice, there is no clear-cut boundary dividing reliance on central bank loans and the merely opportunistic use of monetary policy operations against the backdrop of very favourable conditions, and it is often impossible to clearly assign banks to either of these distinct categories.

## Starting points for steering short-term rates in line with the market

### Banks individually responsible for remaining liquid at all times

The introductory section of the Principles for Sound Liquidity Risk Management and Supervision which the Basel Committee on Banking Supervision (BCBS) published in September 2008 unequivocally assigns primary responsibility for the sound management of liquidity risk to banks themselves. The explanatory notes on this principle describe the key objectives of banks' liquidity risk management frameworks

*Banks themselves are responsible for managing liquidity risk – even in periods of market-wide stress*

in greater detail: they need to be able to ensure with a high degree of confidence that banks are in a position to both address their daily liquidity obligations and withstand a period of liquidity stress affecting both secured and unsecured funding, the source of which could be bank-specific or market-wide.<sup>19</sup>

*Banks that fail to meet their liquidity management duties put pressure on central banks to act*

The BCBS document not only provided an objective for banks' liquidity risk management practices – one which was by no means consistent with reality in the years immediately preceding the financial crisis, as it became increasingly clear from August 2007 onwards, if not before. There were also clear signs that credit institutions' failings in managing their liquidity (risk) were going to put the public sector – and central banks in particular – under ever greater pressure to take action. Given that a host of banks in the euro area remain as reliant as ever on central bank loans five and a half years on from the height of the financial crisis, the calls for banks themselves to ensure that they can always honour their payment obligations have acquired even greater urgency.

*Collectivising banks' liquidity management would lead to inefficiently large risks*

Reverting to a style of steering short-term money market rates which is more in line with the market cannot come about if institutions do not take full responsibility once more for their inherent task of managing their own liquidity, having not done so for years owing to the crisis-induced hiatus. What this means practically for credit institutions is that they will need to prudently steer and address imbalances in the asset/liability term profile (maturity transformation), even if that entails missing out on interest income. If the consequences of excessive maturity transformation had to be borne by the central bank – and thus, at the end of the day, by the general public – the level of liquidity risk taken on by the banks would be inefficiently high and any resulting profits would be privatised through payouts to shareholders.

## Neutrality of monetary operations for allocation of resources

Under normal circumstances, banks should not, then, continue to be able to obtain liquidity and funding from the central bank at a lower rate than in the interbank money market. If central bank loans were much more attractive for banks than individually negotiated market terms, then using these facilities would mean intervening in the market price formation process, which might ultimately impair how efficiently resources are allocated. In practice, therefore, banks need to be virtually indifferent to borrowing in the interbank money market or tapping the Eurosystem's liquidity-providing operations. If the money market were steered in conformity with the market, this would also indirectly prevent debtors of securities or credit claims which are eligible collateral for Eurosystem monetary policy operations from receiving preferential treatment.

*Banks need to be indifferent to market-based funding or central bank loans*

## Designing monetary policy instruments from a market conformity perspective

The temporary full allotment of refinancing operations can be largely in conformity with the market. A sufficiently wide interest rate corridor between the main refinancing rate and the deposit facility rate in a high excess liquidity setting encourages banks to offer excess liquidity in the interbank money market at an interest rate that is lower than the main refinancing rate which institutions requiring liquidity need to pay to the central bank. This automatically drives down demand for the refinancing operations, diminishing the volume of excess liquidity, and thus tends to allow the non-standard liquidity-providing monetary policy measures to be run off more quickly. The corridor between

*Combine full allotment with a wide interest rate corridor*

<sup>19</sup> See Basel Committee on Banking Supervision, Principles for Sound Liquidity Risk Management and Supervision, September 2008, notably p 6.

the marginal lending facility and the deposit facility rates needs to be sufficiently wide to encourage money market activities and banks' refinancing behaviour to continue to return to more normal levels.<sup>20</sup>

*Continued high level of excess liquidity indicates that incentives for money market activity are insufficient*

Conversely, a persistent high volume of excess liquidity coinciding with a structural liquidity deficit in the banking system can be interpreted as an indication that the interest rate corridor offers insufficient incentives for private money market activity. In this scenario, the risk premia for interbank loans to institutions which (need to) resort disproportionately to central bank loans would apparently be so high that central bank loans would be a less expensive source of funding for borrowers than the interbank money market. Added to this, the interest rate corridor needs to be wide enough to allow banks to generate sufficient interest income to cover credit risk as well as the cost of monitoring potential counterparties in the interbank money market by the donor institution. If inadequate money market activity means that the highest possible interest margins, which are effectively constrained by the interest rate corridor, are too low, it is no longer attractive for banks to monitor potential counterparties, prompting them to abandon money trading.<sup>21</sup>

*Longer-term and long-term refinancing operations: limited allotment volume and variable-rate tenders*

Much like the temporary full allotment of short-term refinancing operations, a limited supply of longer-term or even long-term refinancing operations is not necessarily incompatible with the market conformity requirement for monetary operations, provided that they are properly designed. LTROs can be largely in line with the market if they are limited in scope (ie kept in short supply) and they are allotted using competitive variable-rate tender procedures. In this case, the central bank merely acts as the rate taker, rather like in the 3-month LTROs which the Eurosystem regularly offered prior to the financial crisis. Allotment rates for these transactions can then be expected to roughly match the interest rates for repo transactions with similar maturities and collateral quality, and they would neither send out an interest rate

signal nor represent an intervention altering the term structure. Banks requiring a disproportionately high volume of central bank funding because, say, they do not have robust access to the money and capital market through their own fault would then be exposed, at least partially, to the disciplining effect of market forces.

So looking to the future, the markets will need to regain responsibility for setting interest rates for longer-term bank funding. This would bolster banks' individual responsibility for managing liquidity risk, and ultimately their credit risk as well, besides diminishing the extent to which the ongoing Eurosystem funding for some banks is still distorting competitive conditions between banks.

## Eligible collateral: credit quality standards and haircuts

Setting credit quality standards for collateral that is eligible for revolving central bank loans which are stricter than those in the repo market reduces the risk of the central bank intervening in the competition among banks for funding by providing refinancing against this collateral as part of its monetary policy operations, and thus unintentionally slipping into the role of lender of first resort. In the repo market, banks which take riskier assets onto their balance sheets and thereby expose themselves to funding risk (maturity transformation) would have to pay a market price for the marginal unit of current account holdings required for refinancing purposes, rather than a price which is more or less administered, depending on the bidding procedure, for participating in the central bank's refinancing operations. The higher potential returns on riskier assets might

*Collateral credit quality standards at least as high as in repo market*

<sup>20</sup> In this context, suspending the liquidity-absorbing operations currently offered by the Eurosystem would likewise help to place renewed emphasis on how the deposit facility rate incentivises money market activity.

<sup>21</sup> See F Blasques, F Bräuning, and I van Lelyveld (2014), A Dynamic Stochastic Network Model of the Unsecured Interbank Lending Market, SWIFT Institute Working Paper No 2012-007, notably section 4.3.

then be offset by higher funding costs, curbing the incentives for banks to purchase riskier securities and grant riskier loans. For this reason, credit quality standards for eligible collateral and haircuts need to be brought more into line with market practice. The quality of eligible Eurosystem collateral should normally at least match the collateral quality criteria in the repo market, and haircuts should be selected by the Eurosystem in such a way as to effectively hedge the Eurosystem against financial risk while not being lower than the haircuts in the repo market.

*Should interest rates vary for different collateral quality?*

Profit-oriented entities such as central counterparties have at times refused to accept certain low quality assets as general collateral or imposed prohibitively high haircuts, often on a discretionary basis. Central banks such as the Bank of England and the US Federal Reserve accept nothing but collateral of the highest quality in the monetary policy operations they use to steer the money market. Lower quality collateral is often only accepted in special facilities designed to achieve financial stability goals where they have been, and still are, subject to higher interest rates<sup>22</sup> and/or carry a stigma which is not normally desired by central banks but nonetheless exists to all extents and purposes. The interest spreads and the stigma involved usually mean that institutions either shun these facilities altogether or use them only to a minor degree and for a limited period of time. At the Bank of England, for instance, these operations are known as “liquidity insurance” – so they are not, in the first instance, monetary policy operations but operations which are strongly geared to financial stability considerations and hence somewhat distinct from the instruments used to achieve monetary policy objectives. This also allows different prices to be set for predominantly monetary policy operations and those which mainly follow financial stability goals without impairing the monetary policy signal sent out by the policy rate.

One key requirement of a Eurosystem collateral framework which is in conformity with the market is that, alongside credit claims of a suitable quality, the Eurosystem should only accept marketable collateral in the monetary policy operations it uses to steer the money market which is in fact liquid as well, that is to say accepted for use as collateral in secured money market transactions in the repo market. Otherwise, there is a risk that certain securities categories are predominantly used as collateral for Eurosystem refinancing operations, which in itself would appear questionable from the perspective of market economy principles. A simple way of gauging whether this requirement has been breached either for a given security or an entire securities category would be to divide the volume submitted to the central bank by the total outstanding volume (placed in the market); if a persistent high proportion of securities is used as Eurosystem collateral, this might suggest that eligibility criteria are somewhat too lax or – from a market conformity angle – that haircuts are insufficient. If a liquidity crisis, say, causes the central bank to temporarily abandon the principle of only providing funding against marketable collateral which is liquid – which may be a warranted course of action in times of crisis – it nonetheless runs the risk that its monetary operations briefly no longer satisfy the criterion of market conformity in this respect. Market conformity tends to be more constrained, the less the cost of obtaining central bank funding distinguishes between different collateral quality levels and the lower the credit quality threshold for eligible collateral.

*Observe liquidity of marketable collateral*

In all of these matters, the central bank must avoid being an ongoing source of central bank funding for institutions whose poor credit

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<sup>22</sup> As a case in point, the Bank of England sometimes offered funding against lower quality collateral at a tiered interest spread which successively increased as the quality of the collateral provided diminished. As part of its current Indexed Long-Term Repo operations, the Bank of England requires minimum interest spreads of as much as 15 bp at present for borrowing against different collateral sets in competitive bidding procedures.

## Using asset-backed securities as eligible collateral and for obtaining Eurosystem refinancing on favourable terms

Up to now, the Eurosystem has not made a distinction between collateral of differing quality when setting interest rates for monetary policy refinancing operations. Moreover, the rate on refinancing operations does not depend on the maturity of the refinancing operations. For various kinds of collateral, the Eurosystem refinancing operations conducted as full-allotment tenders in the context of an expanded collateral framework have become an attractive source of financing, which has been used in an opportunistic manner and on a large scale by numerous banks.

Amongst other things, this has led to more and more asset-backed securities (ABS) being pledged directly to the Eurosystem – ABS which issuers have found all but impossible to place on the primary market since the onset of the financial crisis. For banks, ABS have the advantage that they allow them to bundle loans that are otherwise virtually impossible to sell or refinance. ABS are now often used by banks solely to ensure financing from the Eurosystem. This is evident, for example, in the clear increase in the size of transactions and very low coupons – a sign of the collateral value being optimised. There is often no “market test” to determine whether private investors are at all willing to pay a price for these securities. From an investor’s perspective, however, risk factors are now less of a consideration. Instead, banks point out that they refrain from acquiring ABS on account of the increased regulatory requirements, since the returns to be achieved with them are unattractive when measured against the capital requirements imposed by regulators. The reduced market activity means that there is a shortage of market price information that the Eurosystem could use as a basis for determining the value of the collateral. The Eurosystem substitutes model-based “theoretical prices” for the missing market prices, with the theoretical prices

now being more predominant than market prices for the ABS pledged to the Eurosystem.

A concentration of essentially marketable assets, which, however, can rarely be placed on the market at present, might be an indication that the Eurosystem has subverted market conditions since the onset of the financial crisis and, in doing so, interfered in competition between institutions. However, regulatory aspects could also be playing a part in banks’ increased use of ABS as collateral for Eurosystem refinancing. With regard to the level of regulatory requirements for European ABS, which is the target of complaints from various sources, it is important to note that, on the one hand, credit risk trading is fundamentally a useful market from an economic perspective.

On the other hand, the stricter regulation of ABS since the onset of the financial crisis should prompt financial market players to take due account of risks so that, at the end of the day, the taxpayer is not left bearing responsibility for the risks which banks have taken with the intention of making a private profit. In any event, the combination of stricter regulation and attractive Eurosystem refinancing operations with full allotment of tenders has led to a widespread collapse in the market for certain ABS, leaving the Eurosystem to finance a considerable part of the ABS senior tranches. Thus, the key question with regard to market orientation – a question which remains to be answered – is whether regulation is leaving enough room for market participants to carry out appropriate transactions in the market on their own responsibility. Indeed, the Eurosystem should organise its monetary policy refinancing operations, including the current collateral framework, in such a way that it does not become the primary source of funding for certain asset classes.

*Only financially sound banks should be monetary policy counterparties*

standing means that they can no longer obtain liquidity and funding from other market players in the money and capital market. The transition to this kind of post-crisis regime can be supported by the assessment of banks' balance sheets, which is currently being carried out before the ECB assumes responsibility for the Single Supervisory Mechanism. This review seeks to shed light on weaknesses in the balance sheets of the institutions being examined, identify the need for action and prepare the ground for decisions regarding necessary capital measures or, if need be, the resolution of institutions. This would also support the process by which banks' refinancing behaviour returns to more normal levels and bolster the growth in confidence in the money and financial markets.

## ■ Conclusion

*Proper functioning of financial system safeguarded but adverse incentives put in place*

Time and again, the deployment of non-standard liquidity-providing monetary policy measures to steer the money market has kept the financial system functioning through the crisis in recent years. Considering the severity of the tension observed during the crisis, the measures taken were certainly warranted on the whole. Yet it must not be forgotten that these measures also set substantial adverse incentives, the effects of which become more pertinent the longer the measures remain in place.

*Non-standard monetary policy measures might obstruct market exit*

The combination of full allotment, long-term monetary policy refinancing operations, a broad range of counterparties and an extended collateral framework in recent years is likely to have contributed to the outcome that hardly

any credit institutions were forced out of the market, almost regardless of how much risk they had taken on and how far the credit risk, not to mention the liquidity and funding risk they had taken on with a view to reaping higher potential profits, actually materialised.

While it is true that discontinuing the non-standard policy measures introduced in response to the crisis is not yet on the agenda at the current juncture, the Eurosystem needs to ask itself the question, after years in crisis response mode, what role a central bank operating an independent monetary policy can play in the future. This particularly includes intensely debating whether and to what extent the Eurosystem does not merely cover the banking system's aggregate liquidity deficit but is also allowed to fund banks and thereby intervene in competitive conditions between institutions.

As a general principle, the market mechanism, augmented by an appropriate regulatory framework, can make important contributions towards curbing the risk taken on by banks, unless rescuing banks to safeguard short-term financial stability becomes the norm, rather than the exception. The Eurosystem therefore needs to strengthen the disciplining effect of money and capital market forces and make banks responsible for the consequences of their actions. More than five years on from the height of the financial crisis, it is becoming ever more important to help the money market to return to more normal conditions, not least as a means of letting the healing effect of competition reduce the existing inefficiencies in the banking and financial system and enhancing growth prospects in the euro area.

*Is the Eurosystem allowed to fund banks, and should it do so?*

*Greater focus on the market and competitive conditions to strengthen growth prospects in the euro area*