

Bucalossi, Annalisa et al.

Research Report

Basel III and recourse to Eurosystem monetary policy operations

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A. Bucalossi, C. Coutinho, K. Junius, A. Luskin,
A. Momtsia, I. Rahmouni-Rousseau, B. Sahel,
A. Scalia, S. W. Schmitz, R. Soares,
F. Schobert and M. Wedow

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Abstract

Following the emergence of the financial crisis in August 2007, the Basel Committee on Banking Supervision established in 2010 a new global regulatory framework. In addition to raising capital requirements, it introduced three ratios, two of which set out minimum standards for liquidity and funding risk, i.e. the liquidity coverage ratio and the net stable funding ratio, and one which aims to limit leverage in the banking system, i.e. the leverage ratio. All three ratios can have a number of implications for monetary policy implementation, in particular the liquidity coverage ratio and the net stable funding ratio owing to the special role of central banks in providing liquidity. This paper investigates the extent to which the regulatory initiatives might have already had an impact on banks' behaviour in Eurosystem monetary policy operations. It also provides an overview of the regulatory state of play and major recent advancements in banks' compliance with the three Basel III ratios. Based on aggregate data, the empirical evidence generally supports some of the theoretically predicted effects of the three ratios. However, no firm conclusions can be drawn as to whether the introduction of the three ratios could cause a significant change in banks' recourse to Eurosystem monetary policy operations. This is partly due to the fact that, in aggregate, major developments, such as substantial fluctuations in the recourse to Eurosystem refinancing operations in the years between 2012 and 2015, have been driven by the financial crisis and the gradual recovery from it, as well as by the accommodative stance of monetary policy.

JEL codes: G28, E58

Keywords: Basel III, liquidity regulation, monetary policy implementation

Non-technical summary

The Basel Committee on Banking Supervision (BCBS) in 2010 introduced two ratios for addressing liquidity and funding risk, i.e. the liquidity coverage ratio (LCR) and the net stable funding ratio (NSFR), as well as a ratio aimed at limiting the excessive build-up of leverage in the financial sector, i.e. the leverage ratio (LR). Since the introduction of these ratios, the Eurosystem has been monitoring whether they might interfere with the implementation of its monetary policy, both from a theoretical perspective and from an empirical perspective to the extent that such observations could already be made. Among the three ratios under consideration, potential interactions with monetary policy implementation mainly arise from the LCR, owing to central banks' special role as sole provider of central bank money and lender of last resort. This paper is the result of the latest monitoring exercise that the Eurosystem conducted during the past years. The main findings of the monitoring report for 2015 are summarised as follows:

Banks' compliance with the prudential ratios

Banks have been front-running in fulfilling the minimum levels of the LCR, NSFR and LR. The European Banking Authority (EBA) Quantitative Impact Study (QIS) shows that, in December 2014, the majority of EU banks in the sample had already fully complied with the levels for the LCR and NSFR and also with the level of 3% for the LR which is currently being tested. Even when implementation dates are still far away, regulatory initiatives receive the attention of rating agencies, investors, regulators and central banks once the standards are published, and therefore seem to have an impact on banks' compliance with regulatory ratios well in advance.

The impact of regulatory developments

Generally speaking, the effects of the regulatory standards on monetary policy operations, the use of assets as collateral and repo market turnover seem contained. Two of the main predicted effects, i.e. an increased demand for Eurosystem liquidity-providing operations and a shift away from the use of high-quality liquid assets (HQLA) towards using non-HQLA as collateral, cannot be generally confirmed based on aggregate data. The expected effects have been potentially weakened with the broader definition of the universe of HQLA under the EU delegated act of 10 October 2014, compared with the Basel III definition¹. With this broader definition, the universe of HQLA has grown by approximately €150 billion (based on Eurosystem eligible assets) and therefore banks' decisions to use the Eurosystem credit operations have become less impacted by the need to fulfill the LCR.

¹ The EU has transposed the Basel LCR requirement in European legislation by way of the Capital Requirements Regulation (CRR). In October 2014, it adopted a delegated act that specifies these requirements. It became binding in October 2015.

The picture looks different for banks that currently have a share of non-HQLA collateral of at least 70% in their collateral pools. These banks have, on average, a share of non-HQLA of almost 90% in their pools, compared with only 60% approximately four years earlier. While this phenomenon may be the result of several concurrent factors, it seems to indicate that the banks concerned achieved higher LCR levels by increasing their usage of Eurosystem credit operations using higher shares of non-HQLA collateral.

A case study on the LR shows that potentially unintended effects on the implementation of monetary policy, such as reduced arbitrage activity in secured markets or the deterrence of LR-constrained banks from using central bank repo operations, cannot be confirmed based on data until June 2014. Improved levels of the LR up to June 2014 have been achieved inter alia via a large reduction in repo borrowing from the Eurosystem. Against the backdrop of the newly reached LR levels, this requirement has posed a mild constraint on individual participation in the targeted longer-term refinancing operations (TLTROs).

Elements to be agreed with central banks

The regulatory provisions foresee that central banks have to agree with supervisors on the regulatory treatment of central bank reserves for the purpose of the LCR and NSFR, and also on a possible reduction of the required stable funding (RSF) factor for collateral pledged for exceptional central bank operations (e.g. the TLTROs).² Preferential treatment via reduced RSF factors might be justified if central banks fear that banks are refraining from accessing those exceptional operations owing to the expected lower NSFR levels. This is however the case only in some specific situations, i.e. when banks use collateral with initially low RSF factors, such as government bonds. While the Governing Council of the ECB, after consulting the Supervisory Board, has already decided on a treatment of central bank reserves as HQLA for the purpose of the LCR, such a decision is still outstanding for the purpose of the NSFR. A case study on the NSFR, based on current collateral usage, shows that banks' NSFR levels would generally benefit from participation in TLTROs. A reduction of the RSF factor would therefore not necessarily be advisable, as a preferential treatment may also create an incentive for banks to tap central bank liquidity rather than market funding sources.

Counterparties' views on the regulatory impact

Feedback from market participants including the Eurosystem's monetary policy counterparties, gathered via regular talks and also occasional questionnaires, revealed that banks believe it is important to comply with the new ratios before they become binding, and they have partly started to report the ratios in their strategic plans and financial statements.

² European Commission (2014), BCBS (2014b).

Holding HQLA was reported by counterparties to have an adverse impact on profitability in the current low-yield environment. However, most counterparties also stated that the significant deleveraging undertaken to date, and in some cases the existing rules in their home jurisdiction, have ensured that the new standards have generally not required any major adjustments on their part. Going forward, banks consider that both asset origination and funding are now assessed and priced according to their impacts on the regulatory ratios. Counterparties mentioned that a shift from unsecured to secured activity might be occurring. Even so, market participants expect activity in the repo market to be adversely impacted.

Collateral management processes already incorporate the objective of preserving sufficient LCR-eligible assets from being encumbered. A number of counterparties stated that they would be reluctant to sell HQLA to the Eurosystem in the context of the expanded asset purchase programme (APP) because such assets would be preferred to other assets in meeting the LCR and, for some counterparties, also to cash.

1 Introduction

Following the emergence of the financial crisis in August 2007, the BCBS established in 2010 a new global regulatory framework. In addition to raising capital requirements, it introduced three ratios, two of which set out minimum standards for liquidity and funding risk (the liquidity coverage ratio and the net stable funding ratio) and one which aims to limit leverage in the banking system (the leverage ratio). All three ratios can have a number of implications for monetary policy implementation, in particular the LCR and the NSFR owing to the special role of central banks in providing liquidity. These possible implications have been the subject of extensive assessment within the Eurosystem since 2011, by means of internal reports covering analytical issues and regular monitoring activity. This paper is based on the monitoring report for 2015.

The paper investigates the extent to which the regulatory initiatives might have already had an impact on banks' behaviour in Eurosystem monetary policy operations, despite the implementation dates being in the future. The paper starts by recalling why liquidity regulation and the leverage ratio actually matter for monetary policy implementation (Chapter 2). It also provides an overview of the regulatory state of play and major recent advancements of the three Basel III ratios and their implementation in EU legislation via the Capital Requirements Regulation and highlights the main revisions of the ratios which are relevant for monetary policy implementation (Chapter 3). Chapter 4 describes how, according to data as at June and December 2014, banks manage to fulfill the ratios and how these ratios have developed over time. It also looks at the extent to which banks have reacted to regulatory developments and how the predicted pattern in relation to monetary policy implementation is supported by empirical evidence. The paper ends with a summary of feedback received from counterparties and some conclusions.

2 Why do liquidity regulation and the leverage ratio matter for monetary policy implementation?

While the objective of financial regulation is to strengthen the financial sector's capacity to face adverse shocks, it has to be kept in mind that, given central banks' monopoly power over issuing base money, banks have to interact with the central bank, in particular as central banks play a key role as lender of last resort for banks under liquidity stress. Due to these interactions, regulatory standards can have an impact on the effectiveness of monetary policy implementation, and it is therefore desirable to monitor and assess any such impact.

The regulatory standards under discussion can affect monetary policy implementation via a number of channels. They can either directly influence the way in which banks have recourse to central bank operations, or they can have an impact on money markets by influencing demand for certain maturities or types of securities. The functioning of the money markets is of particular concern for central banks, as steering short-term interest rates is the first stage of the monetary transmission process, i.e. the interest rate channel. This is why money markets play a vital role in the monetary transmission process.

The stated objective of the LCR, which in the EU entered into force in October 2015, is to ensure that banks maintain an adequate level of unencumbered, high-quality liquid assets that can be converted into cash to meet their liquidity needs under a 30-day scenario of severe funding stress. The LCR is defined as the ratio of the stock of HQLA to net cash outflows expected over the stress period. The standard requires that the value of the ratio does not decline below 100% on an ongoing basis. The HQLA definition groups eligible assets into two categories. Level 1 assets, which can be included without limit, are those with a 0% capital risk weight under the Basel II standardised approach, such as cash, central bank reserves and sovereign debt under certain conditions. Level 2 assets, which can make up no more than 40% of the buffer, include assets with low capital risk weights as well as highly rated non-financial corporate and covered bonds, subject to a 15% haircut. Depending on the quality and liquidity of Level 2 assets, these are classified as either Level 2A or Level 2B. Net cash outflows, in turn, are calculated on the basis of agreed run-off and inflow rates that are applied to different sources of cash out- and inflows (with an aggregate cap of 75% of total cash outflows).

The NSFR, which will be introduced as of January 2018, aims to limit overreliance on short-term wholesale funding, to encourage a better assessment of funding risk across all on- and off-balance-sheet items, and to promote funding stability. A stable funding profile is intended to reduce the likelihood that disruptions to a bank's regular sources of funding will erode its liquidity position in a way that would increase the risk of its failure and potentially lead to broader systemic stress. The NSFR is defined as the ratio of available stable funding (ASF) to required stable funding

(RSF), which should be equal to at least 100% on an ongoing basis. The numerator is determined by applying ASF factors to a bank's liability positions, with higher factors assigned to longer maturities according to pre-defined maturity buckets (less than six months, between six and 12 months, and longer), and to funding sources with a more stable behaviour. The denominator reflects the product of RSF factors and the bank's assets, differentiated according to HQLA/non-HQLA definitions and by counterparty (financial/non-financial). Asset encumbrance generally results in higher RSF factors, especially for longer encumbrance periods. For example, assets encumbered for a period of one year or more receive the maximum RSF factor of 100%, while central bank reserves normally have a factor of 0% and other Level 1 assets a factor of 5%. Differentiated RSF factors also apply according to whether assets are secured against Level 1 assets or not.

The leverage ratio, which will be in force as of January 2018, is a non-risk-weighted capital standard aimed at limiting leverage in the banking system. It is computed as a ratio between the Tier 1 capital and the exposure measure.

How are the regulatory standards expected to have an impact on monetary policy operations?

A range of research has been undertaken in order to assess the impact that the new regulatory standards may have on monetary policy implementation, closely related financial markets and banks' business models. Assessing the overall theoretical impact, which takes into account the cumulative effects, is not straightforward, as ratios may work in different directions and also to varying degrees. A recent study by the Committee on the Global Financial System (CGFS),³ which assesses the interactions of the regulation with different monetary policy frameworks, including that of the Eurosystem, summarises the main expected overall outcome and net effects as depicted in Table 1 for money markets and in Table 2 for central bank operations. The LCR attracts most attention in these studies.

Table 1
Regulatory reform and money markets: impact on volume (V), rates (r) and volatility (σ)

Market segment	LR			LCR			NSFR			Cumulative		
	V	r	σ	V	r	σ	V	r	σ	V	r	σ
Unsecured												
< 30 days	↓	↓	↑	↓	↓	↑	?	↑	?	↓	↓	↑
> 30 days	↓	↓	↑	?	↑	↑	?	↑	?	↓	?	↑
Secured (HQLA)												
< 30 days	↓	↓	↑	?	↓	?	↓	↑	↑	↓	↓	↑
> 30 days	↓	↓	↑	?	↑	?	?	↑	?	?	?	↑
Secured (non-HQLA)												
< 30 days	↓	↓	↑	?	↓	?	↓	↑	↑	?	↓	↑
> 30 days	↓	↓	↑	?	↑	?	?	↑	?	?	?	↑

Source: CGFS (2015).

Notes: The NSFR will lead to a steepening of the unsecured and secured yield curves beyond the six-month tenure. . In the secured market, this steepening will increase with the riskiness of the collateral.

³ Conducted by a working group established by the BIS Committee on the Global Financial System and the Markets Committee.

Table 2**Regulatory reform and demand for central bank operations**

Operations	LR	LCR	NSFR	Cumulative
Reserve-providing				
Repo (HQLA)	↓	↘	↑ (>6m)	↓ (<6m)
Repo (non-HQLA)	↓	↑	↑ (>6m)	?
Outright purchases	↘	↔	↗	?
Reserve-absorbing				
Reverse repo	↔	↗	↘	↔
Term deposits	↔	↔ or ↓	↓ (>6m)	↓ (>6m)
Outright sales (HQLA)	↔	↔	↘	↘
Outright sales (non-HQLA, foreign assets)	↔	↓	?	↘
Reserve-neutral				
Collateral swaps	↔	↑	↑	↑

Source: CGFS (2015).

Note: ↓ = down; ↑ = up; ↘ = down at the margin; ↗ = up at the margin; ↔ = little impact.

The main effects to be expected and which are relevant for the Eurosystem's monetary policy implementation are as follows:

Functioning of the money markets

- The crisis proved that overreliance on short-term unsecured money market funding is not sustainable, as it can lead to severe funding difficulties in times of eroding market confidence. The LCR takes account of this lesson by using a 100% run-off rate for unsecured short-term money market funding. As a consequence, it is expected that the short-term end of the yield curve will steepen, shifting money market activity away from short-term and overnight funding.⁴ This may give rise to certain challenges with regard to the controllability of short-term money market rates, which are important as they are the first step in the transmission process of monetary policy. Furthermore, the leverage ratio provides a disincentive for banks to conduct money market arbitrage and to provide market-making, as the implied capital requirement of the leverage ratio makes banks' repo transactions more expensive. The leverage ratio is expected to lead to lower money market volumes which may in turn weaken the link between the central bank policy rates and market rates and consequently the monetary policy transmission.⁵

Recourse to liquidity-providing operations

- Theoretically, the LCR may lead to an increased use of Eurosystem liquidity provision.⁶ As central bank reserves form part of Level 1 HQLA, banks could

⁴ Schmitz (2013), Bonner and Eijffinger (2013), Banerjee and Mio (2014) and CGFS (2015).

⁵ CGFS (2015).

⁶ Bech and Keister (2013), Bindseil and Lamoot (2011), Schmitz (2013) and CGFS (2015).

have recourse (by using non-HQLA) to liquidity-providing central bank operations in exchange for high quality reserves to meet the LCR. Generally, banks could be incentivised to demand central bank funding and then redeposit it with the Eurosystem. The LCR generally creates an incentive for banks to increase their reliance on Eurosystem credit provision rather than on market sources. The LCR assumes a 100% rollover rate for central bank operations, regardless of their maturity and of whether they are collateralised with HQLA or non-HQLA. One could therefore expect generally higher recourse to central bank operations.

- The LR, however, creates exactly the opposite incentive, as central bank reserves count towards the exposure measure and will be subject to a capital charge. Banks may therefore have a weaker incentive to have recourse to central bank liquidity-providing operations.
- The NSFR could increase the demand for longer-term central bank liquidity provision if the maturity of such operations is longer than six months, depending on the haircut on the collateral provided.⁷

Substitution of HQLA with non-HQLA collateral posted with the Eurosystem

- Banks will have a greater incentive to use non-HQLA (e.g. certain asset-backed securities, credit claims, uncovered bank bonds, lower-rated covered bonds, etc.) as collateral in monetary policy operations, as this would increase the amount of unencumbered HQLA and therefore also the LCR. This effect directly relates to the difference between the set of collateral eligible for the Eurosystem's credit operations and the definition of HQLA in the LCR. This incentive is therefore particularly high if the universe of HQLA is narrow compared with the universe of central bank eligible collateral and is further strengthened by the different haircuts applied by the Eurosystem and under the LCR. For example, for central government securities with a rating of at least AA- the Eurosystem's haircuts range from 0.5% to 7%, while the LCR does not require any haircut on these securities.

Bidding behaviour

- The convergence towards the LCR may also influence banks' bidding behaviour in open market operations. The liquidity standards could lead to more aggressive bidding behaviour by LCR-constrained banks, which would be reflected in higher allotment rates. The impact of a more aggressive bidding behaviour on short-term interest rates could be significant, if most banks are

⁷ Scalia, Longoni and Rosolin (2013) and CGFS (2015).

LCR-constrained. This will make the steering of the operational target of the central bank more difficult.⁸

Banks' balance sheets

- The most recent literature focuses on the impact of liquidity regulation on banks' balance sheets (Banerjee and Mio, 2014, Duijm and Wiertz, 2014). Overall, in response to tougher liquidity regulation, banks replaced claims on other financial institutions with cash, central bank reserves and government bonds. Therefore, the size of the interbank market will most probably be reduced, which could have implications for the monetary policy transmission mechanism. However, there is no evidence that the tightening of liquidity regulation has had a detrimental impact on lending to the real economy. In response to stricter rules, banks did not alter the overall size of their balance sheets to meet higher liquidity requirements, but instead adjusted both their asset and liability structures. Duijm and Wiertz (2014) suggest that when the gap between a bank's actual liquidity ratio and its required ratio is below its long-term average, banks adjust their balance sheets by increasing the share of stable forms of funding, while the response of liquid assets is insignificant.

⁸ Bech and Keister (2012, 2013).

3 Where do the LCR, NSFR and LR stand now? Regulatory state of play

In Europe, full implementation of all three ratios is foreseen by 2018 (Table 3).

Table 3
Phasing-in of liquidity regulation and the leverage ratio

	2015 ¹⁾	2016	2017	2018
LCR	60%	70%	80%	100%
NSFR	observation period			100%
LR			final adjustments to definition	3% ⁹

¹⁾ For the LCR, January 2015 according to the Basel III international framework; October 2015 in the EU, according to the EU delegated act of 10 October 2014.

3.1 Liquidity coverage ratio

3.1.1 State of play

The Group of Governors and Heads of Supervision (GHoS), which acts as the oversight body of the BCBS, endorsed the last adjustments to the LCR as well as its disclosure requirements in January 2014.

In the European context, the EU delegated act of 10 October 2014 specifies in detail the general LCR requirement for EU banks, which became applicable in October 2015, with a progressive rate of application rising from 60% to 100% in 2018. In particular, the definition of liquid assets eligible for the ratio extends to extremely high-quality covered bonds and certain asset-backed securities (ABSs) that have displayed superior or comparable performance to those admitted by Basel III. Thus, the EU delegated act permits ECAI (external credit assessment institution) 1 covered bonds with an issue size of at least €500 million as Level 1 assets, as well as ECAI 2 covered bonds with a minimum issue size of €250 million as Level 2A assets. Level 1 assets, excluding covered bonds however, have to be at least 70% of the buffer. Haircuts of ECAI 1 and ECAI 2 covered bonds are 7% and 15%, respectively. Within a 15% limit of the liquidity buffer envisaged for Level 2B assets, the delegated act includes some other types of securities such as certain auto-loan ABSs, SME (small and medium-sized enterprise) ABSs and consumer credit ABSs. Level 2B also includes restricted-use committed liquidity facilities that may be provided by the Eurosystem. Table 4 compares the definition of HQLA under the EU delegated act with the Basel III framework.

⁹ The level has not yet been decided yet; 3% is currently being tested for the EU.

Table 4**HQLA definition according to the EU delegated act vs. Basel III**

EU delegated act		Basel III framework	
Stock of HQLA	Factor	Stock of HQLA	Factor
Level 1 assets: Banknotes and coins Qualifying assets representing claims on or guaranteed by sovereigns, central banks (ECAI 1), public-sector entities and multilateral development banks Qualifying central bank reserves High-quality covered bonds (ECAI 1) with a minimum issue size of €500 million and an asset coverage requirement of at least 2%	100%	Level 1 assets: Banknotes and coins Qualifying marketable securities from sovereigns, central banks, public-sector entities and multilateral development banks Qualifying central bank reserves Domestic sovereign or central bank debt for non-0% risk-weighted sovereigns	100%
Level 2A assets: Qualifying assets representing claims on or guaranteed by sovereigns, central banks (ECAI 1), public-sector entities and multilateral development banks with a risk weight of 20% High-quality covered bonds (ECAI 2) with a minimum issue size of €250 million and an asset coverage requirement of at least 7% Corporate debt (ECAI 1) with a minimum issue size of €250 million and with a maximum time to maturity of ten years	85%	Level 2A assets: Sovereign, central bank, multilateral development bank and public-sector entity assets qualifying for a 20% risk weighting Qualifying corporate debt securities rated AA- or higher Qualifying covered bonds rated AA- or higher	85%
Level 2B assets: Qualifying ABSs (ECAI 1): Residential mortgage-backed securities (RMBSs) Commercial mortgage-backed securities Corporate debt securities (ECAI 3) with a minimum issue size of €250 million and with a maximum time to maturity of ten years Common equity shares listed on a major stock index High-quality covered bonds with a minimum issue size of €250 million and an asset coverage requirement of at least 10% Non-interest-bearing assets (ECAI 5) Restricted-use committed liquidity facilities	75% 65% 50% 50% 70% 50%	Level 2B assets: Qualifying RMBSs Qualifying corporate debt securities rated between A+ and BBB- Qualifying common equity shares	75% 50% 50%

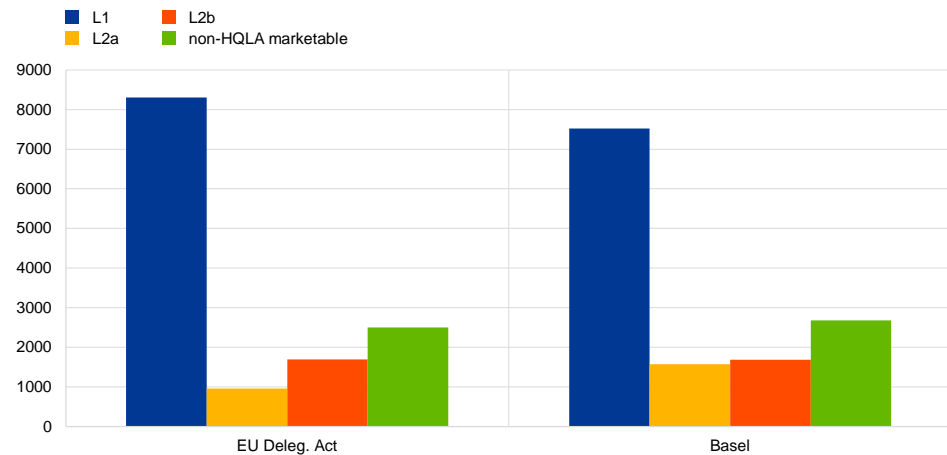
The broader definition of the universe of assets considered as HQLA under the EU delegated act compared with the Basel III definition somewhat lowers the potential impact that the introduction of the LCR may have on banks' decisions to make use of Eurosystem central bank facilities. With the EU delegated act, the HQLA definition has become larger and the universe of assets not qualifying as HQLA but qualifying as ECB collateral has become smaller. Based on the outstanding nominal value of eligible marketable collateral, the amount gained as HQLA is roughly €0.15 trillion¹⁰ (mainly consisting of ABSs that do not qualify as HQLA under the Basel rules) (Chart 1). Furthermore, there is a noticeable shift from Level 2A to Level 1 assets, as well as from Level 2B to Level 2A assets, which will broaden the availability of HQLA due to the lower haircuts and limits to be applied.

¹⁰ After deducting 25% as a proxy for haircuts (the gross nominal value is €0.2 trillion).

Chart 1

Volumes of marketable eligible assets outstanding by liquidity category, according to the Basel III and EU delegated act definitions

(nominal values, € billions, data as at 27 August 2015)



Source: ECB calculations.

Note: The universe of eligible collateral is in fact larger, as also non-marketable assets can be eligible collateral for Eurosystem monetary policy operations.

Another modification of the international standard that is important from a monetary policy perspective is that of the treatment of central bank eligibility of assets for collateral purposes. For the Basel III standard, although central bank eligibility does not by itself constitute the basis for the categorisation of an asset as being liquid, HQLA (except Level 2B assets) should ideally be central bank eligible,¹¹ whereas this criterion plays no role according to the EU delegated regulation. Consequently, EU government bonds denominated in euro are always Level 1 under the EU delegated regulation.

3.1.2 Central bank reserves as Level 1 assets in the LCR: the Eurosystem case

The Base III text and also the EU delegated act on the LCR consider central bank reserves as Level 1 assets, provided that central banks allow banks to withdraw these reserves at times of stress. The extent to which banks can report their central bank holdings as Level 1 assets needs to be agreed on between the central banks and the respective supervisory authority.¹² The Eurosystem has investigated the issue with reference to central bank reserves and fixed-term deposits. In the Eurosystem, central bank reserves comprise balances on the reserve accounts, i.e. minimum required reserves as well as reserves held in excess of the required amount (excess reserves). While the former are remunerated at the rate of the main refinancing operations, the latter are remunerated at the rate of the deposit facility. A reserve averaging provision is in place, according to which the minimum reserve requirement has to be fulfilled by banks on average during the length of the

¹¹ BCBS (2013), paragraph 26.

¹² European Commission (2014).

maintenance period (around six weeks since the beginning of 2015). The main issue when deciding how to include central bank reserves in Level 1 assets arises from the fact that banks need to comply with the required level of the LCR on an ongoing basis, while they only need to fulfil the minimum reserve requirement on average during the maintenance period. In an extreme case, banks could fulfil their entire minimum reserve requirement on the first day of this period (front-loading) or on the last day (back-loading).

In the case of the Eurosystem, the Governing Council, after having consulted the Supervisory Board, decided on 17 December 2014 that:

- the Eurosystem considers only the part of the daily account holdings that exceeds the average daily required reserves as withdrawable in times of stress and thus eligible for inclusion in HQLA;
- fixed-term deposits are considered as HQLA for recognition in the LCR if such fixed-term deposits are considered eligible collateral for Eurosystem credit operations, including the marginal lending facility;
- this decision will be reviewed by the Eurosystem in one year in the light of experience.¹³

3.2 Net stable funding ratio

3.2.1 State of play

In January 2014 the BCBS proposed some amendments to the NSFR, which were put out for consultation until April 2014. Following the consultation, the GHoS endorsed a revised NSFR framework in October 2014,¹⁴ which included changes aimed at addressing any unintended consequences for financial market functioning and the economy as well as at improving the NSFR design with respect to several key issues. The key issues with implications for monetary policy implementation are:

1. the inclusion of a one-year sub-bucket for funding with a residual maturity between six months and one year;
2. the treatment of short-term lending to financial institutions;
3. a possible asset encumbrance exemption for central banks; and
4. the treatment of required reserves.

As regards 1., the revised NSFR framework assigns a 50% RSF factor (compared with 0% in the 2010 NSFR framework) to interbank lending for a period of six months or more and less than one year. Symmetrically, on the funding side, the interbank

¹³ Since the LCR became binding in October 2015 in the EU, a review is expected by end-2016.

¹⁴ BCBS (2014b).

borrowing for a period of six months or more and less than one year is also assigned a 50% ASF factor. In this latter case, the funding provided by central banks is included.

As regards 2., in the treatment of short-term lending to financial institutions the revised NSFR framework does not differentiate between banks and non-bank financial corporations, but rather between lending secured by Level 1 HQLA and other secured and unsecured lending. It applies an RSF factor of 10% to Level 1 HQLA-backed short-term secured lending to all financial institutions and a slightly higher RSF factor (15%) to the remaining short-term lending to all financial institutions (banks and non-banks). It should be recalled that the NSFR Consultative Paper of January 2014 proposed a carve-out for short-term loans to “banks subject to prudential supervision” and applied an RSF factor of 0% in order to avoid negative implications for the transmission of monetary policy. It was considered, however, that the carve-out could have created a bifurcation in the money markets and impaired the monetary policy transmission mechanism, which relies on institutions arbitraging between market rates and policy rates, because economically equivalent loans to entities outside this definition were assigned an RSF factor of 50%. Consequently, the carve-out foreseen in the Consultative Paper was not included in the NSFR framework endorsed by the GHoS in October 2014.

The NSFR Consultative Paper also included a possibility for an exemption 3. to the encumbrance treatment for central bank operations, i.e. assets encumbered for central bank liquidity operations would receive the same RSF factor as a similar unencumbered asset. Generally, the NSFR would give a 100% RSF factor to collateral pledged in a transaction with a maturity longer than one year. This exemption was designed to avoid a situation in which longer-term central bank liquidity operations would result in a reduction in the NSFR, thereby reducing their effectiveness. However, it ignored the fact that the assets were encumbered, so if the liquidity operation had a maturity greater than six months, the proposed treatment would result in the NSFR overstating the bank’s stable funding situation. Moreover, it could have led banks to prefer to borrow from the central bank rather than from private counterparties. The final NSFR framework in October 2014 maintains the optional treatment of collateral encumbered in longer-term central bank operations, but limits the asset encumbrance by (i) putting a limit on the size of the RSF relief and also (ii) limiting it to exceptional operations. As regards (i), the framework now states that these assets may be assigned a reduced RSF factor, which must not be lower than the RSF applied to the equivalent asset that is unencumbered. Supervisors should agree on the appropriate RSF factor with the relevant central bank. As regards (ii), exceptional operations are defined as non-standard, temporary operations conducted by the central bank in order to achieve its mandate in a period of market-wide financial stress and/or exceptional macroeconomic challenges. Targeted LTROs (TLTROs) fulfill the definition of “exceptional operations” as they are non-standard and temporary.

The undesirable effect of incentivising banks to use central bank operations rather than market sources is mitigated in the October 2014 revised NSFR framework given that encumbered collateral with the Eurosystem is not automatically treated more

preferentially. However, in operational terms, as many Eurosystem NCBs have pooling systems instead of earmarking systems, it would have to be decided how to apply different RSF factors to assets used to secure “exceptional” operations and to assets used to secure standard operations like the main refinancing operations (MROs). For simplicity, in principle the central banks might decide not to apply the preferential treatment to any operation. At the Eurosystem level, an agreement between the Eurosystem and supervisors does not exist yet. Different scenarios for the treatment of TLTROs in the NSFR are considered in Section 3.2.2.

With regard to 4. the treatment of required reserves, the final NSFR framework takes into consideration that, in some jurisdictions, reserve requirements must be satisfied over a longer-term horizon. Supervisors may discuss and agree with the relevant central bank on the RSF factor to be assigned to required reserves. Otherwise, all central bank reserves, including required reserves, are assigned an RSF factor of 0% by default.

In December 2014 the BCBS agreed on a document containing the disclosure standards for the NSFR, which was put out for consultation until 6 March 2015. As in the case of the LCR, banks will be required to publish their NSFR using a common template at the same frequency as the published financial statements (i.e. typically quarterly or semi-annually). Banks will be required to comply with these disclosure requirements from the date of the first reporting period after 1 January 2018.

3.2.2 Treatment of longer-term central bank operations in the NSFR: scenario analysis for Eurosystem TLTROs

The Eurosystem has so far not agreed with the supervisors on a lower RSF factor for encumbered collateral in longer-term central bank operations such as the TLTROs. This possible preferential treatment has been included to avoid that the NSFR declines as a result of encumbering assets in long-term operations which could deter banks from participating in these operations. The following scenario analysis provides an estimate of the effects if a 100% RSF factor (i.e. no preferential treatment) is applied to assets that are encumbered as collateral in Eurosystem TLTROs, which have an initial maturity of four years.¹⁵ This analysis is limited to the direct effect of liquidity borrowed via the TLTROs and it does not consider the subsequent impact on the NSFR that derives from lending to the real economy. However, the additional impact of new lending on the NSFR due to the TLTRO is likely to be relatively contained and should thus not materially change the findings.¹⁶

The following examples illustrate how the consideration of certain asset types as encumbered collateral may have different impacts on the NSFR of banks that make use of long-term central bank operations.

¹⁵ As data on the NSFR for individual banks are not available to the ECB, the absolute amount in terms of the change in the difference between funding obtained (ASF) and the RSF owing to the change in the encumbrance is estimated.

¹⁶ See ECB (2014a) and footnote 18.

Example 1: a bank uses €100 of a government bond in the TLTRO (LCR Level 1 asset)

According to the current definition of the BCBS, an unencumbered government bond receives an RSF factor of 5%, whereas, if it is encumbered for more than a year, it receives an RSF factor of 100%.

The available stable funding (ASF) factor for central bank funding with an effective residual maturity of one year or more is 100%. In the present example, this corresponds to an ASF of €94, if a valuation haircut of 6% is assumed for the government bond.¹⁷

In this example, compared with a situation where no central bank funding was obtained (ASF=0) and an unencumbered government bond was held (RSF=5%), a bank could be discouraged from participating in a central bank operation with a maturity of more than one year, e.g. in the TLTRO. Available funding would admittedly increase by €94, but at the same time required stable funding would increase by €95, i.e. from €5 to €100, thus lowering the NSFR.¹⁸

From a central bank's perspective, this may be an issue of concern, as it could deter banks from having recourse to longer-term central bank funding. However, banks typically do not use as collateral a single type of asset, but rather a mix of different types, such as covered bonds, ABSs or, in the case of the Eurosystem, also non-marketable assets, which do not qualify as liquid assets under the LCR, for example. The various asset classes are treated differently under the NSFR, obtaining different required stable funding requirements, and also with regard to valuation haircuts applied by central banks.

Chart 2 below provides an overview of the composition of collateral pledged by banks participating in the TLTRO, according to the liquidity categories for assets as defined in the EU delegated act for the LCR. The LCR definition for liquid assets applies also to the treatment of liquid assets under the NSFR. On aggregate, the collateral pool is composed of the full range of LCR eligible assets and dominated by LCR non-eligible assets. Non-HQLA obtain an RSF factor of 85% when they are unencumbered, which rises to 100% when they become encumbered, e.g. in the TLTRO. As a result, the effect on the NSFR is positive, as example 2 below shows.

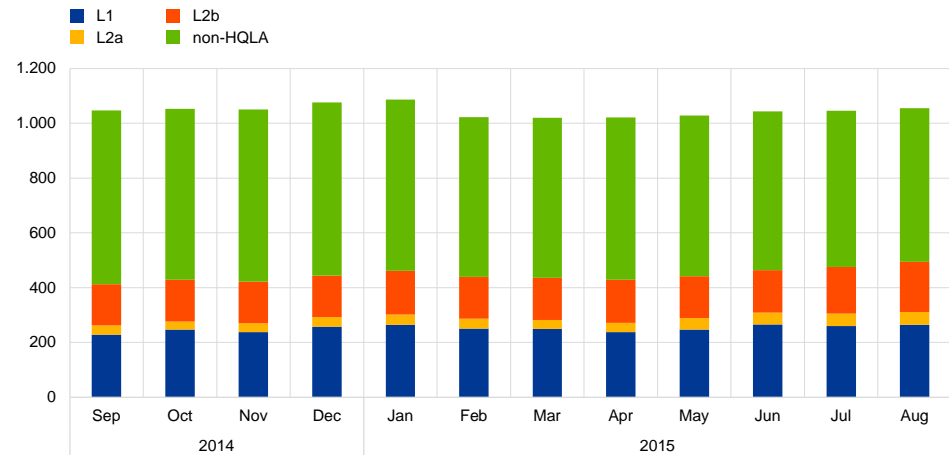
¹⁷ The Eurosystem applies a haircut of between 0.5% and 7% for government bonds with a rating of at least credit quality step 2, depending on the residual maturity and coupon type.

¹⁸ If the additional funding obtained is used to extend new lending, an additional factor needs to be added to the calculation, e.g. 1 if all additional ASF is used to extend loans with a maturity of more than one year: $\Delta\text{NSFR} = \text{ASF} - \Delta\text{RSF} - \Delta\text{RSF (from new loans)} \rightarrow 94 - 95 - 94 = -95$; the NSFR would decrease by the full change in the RSF owing to asset encumbrance. However, banks are not required to use the ASF obtained via the TLTRO to extend new lending. As a result, the additional change in the RSF from new lending will be relatively contained.

Chart 2

Composition of collateral of banks participating in the TLTRO by HQLA category

(collateral values after haircuts, € billions)



Source: ECB calculations.

Example 2: a bank uses €100 of non-marketable assets in the TLTRO (non-HQLA for the LCR)

The RSF factor for non-marketable assets, if they are unencumbered, is 85% and rises to 100% if they are encumbered for more than one year. The corresponding ASF factor for central bank funding is only 80% in this example, as a higher valuation haircut of 20% applied by the central bank is assumed. Thus, the net effect in this case is a positive impact on the NSFR. Without central bank funding, a bank holds unencumbered non-marketable assets on its balance sheet, i.e. the ASF is €0 and the RSF is €85. If the bank receives long-term central bank funding, collateralised by non-marketable assets, the ASF is €80 and the RSF is €100. The net effect on the NSFR is positive, i.e. an ASF increase of €80 (from €0 to €80) versus an RSF increase by only €15 (from €85 to €100).

The examples show that the incentive to participate in a long-term central bank operation depends on the aggregate composition of the collateral pool for individual banks, and on what type of asset is considered for collateralising this type of long-term central bank operation.

Impact of allocating different asset types in a collateral pool to various monetary policy operations: four different scenarios

The Eurosystem does not earmark the collateral used in its operations. Instead, a pool of collateral is put forward by the banks and the overall value of the total amount of collateral, after application of haircuts, needs to cover the funding obtained from the Eurosystem. This has to be taken into account for the following analysis, which is based on data on individual banks' recourse to TLTROs and other Eurosystem credit

operations and their respective asset pools, taking into account observations between September 2014 and February 2015. Many banks do not use the full collateral pool, holding more collateral than is actually needed. As regards the question which assets to consider as encumbered for central bank operations, one needs to decide which type of collateral would be considered first for which type of operations, and which ones subsequently. Banks typically participate in a number of central bank operations with different maturities, the collateral for which may need to be considered as encumbered assets as well. In March 2015 all Eurosystem credit operations, except the TLTROs, had a residual maturity of less than six months and were thus treated as not encumbering collateral. The NSFR assigns higher RSF factors only when the collateral is encumbered for more than six months. The following analysis, however, also considers scenarios under which assets are encumbered for these operations as well. In order to understand the different effects on the NSFR, depending on which type of collateral is considered as encumbered first, the below scenarios distinguish four cases.

Scenarios 1 and 2 quantify how many banks using the TLTRO would be negatively impacted as regards their NSFR levels, assuming under scenario 1 that existing non-HQLA collateral is considered as encumbered first (bottom up) and under scenario 2 that Level 1 assets are considered as encumbered first and non-HQLA collateral is encumbered last (top down). As the RSF factor increases less for non-HQLA (because unencumbered non-HQLA have a higher RSF than HQLA-eligible assets), scenario 1 is likely to lead to a more beneficial effect on the NSFR as the previous examples illustrate. Scenarios 3 and 4 additionally take into account other credit operations such as MROs. For simplicity, it is assumed that these operations encumber assets ahead of the TLTRO. Under the bottom-up scenario, taking into account other operations first, scenario 3 is likely to lead to a less accommodating effect on the NSFR relative to scenario 1, as it is more likely that non-HQLA collateral is already fully used up by those other operations, and that the long-term operation (TLTRO) may require the encumbrance of Level 1 assets. Under the top-down scenario 4, the effect should lead to an improvement relative to scenario 2. The expected order of the scenarios from best to worst in terms of improvements in the net stable funding is $S1 > S3 \approx S4 > S2$.

Table 5
Order of encumbrance of collateral pools

Scenario 1: bottom up	Scenario 2: top down	Scenario 3: bottom up + other operations	Scenario 4: top down + other operations
Level 1	Level 1	Level 1	Level 1
Level 2A	Level 2A	Level 2A	Level 2A
Level 2B	Level 2B	Level 2B	Level 2B
Non-HQLA	Non-HQLA	Non-HQLA	Non-HQLA

Table 6 shows the change in net stable funding ($\Delta\text{NSF}=\text{ASF}-\Delta\text{RSF}$) for all banks participating in the TLTRO under the four scenarios. The number of banks in the sample is 578 from 18 euro area countries. As expected, scenario 1 yields the most favourable effect for ΔNSF , while scenario 2 is the least favourable. This conclusion is drawn from the fact that the mean, minimum and maximum values across the sample of banks are higher under scenario 1 (bottom up) than under scenario 2 (top down). Scenarios 3 and 4 are in between the two baseline scenarios. The most important finding, however, is that on average banks benefit from participating in the TLTRO in terms of a rising NSFR, under the assumption of a 100% RSF factor for assets encumbered for more than one year. Only two banks would experience a decline under scenario 1 and, taking into account other operations, this would increase to 15 banks under scenario 3.

Table 6
Change in net stable funding of individual banks

(€ millions, 2014-15)

	Variable	Obs.	Mean	Min.	Max.	No of banks $\Delta\text{NSF}<0$
Bottom up	Scenario 1	2,435	235	-123	11,822	2
	Scenario 3	2,435	212	-790	11,822	15
Top down	Scenario 2	2,435	64	-593	8,866	26
	Scenario 4	2,435	132	-84	8,866	15

Notes: Monthly observations from September 2014 to February 2015 are used. The six data points together with the number of banks result in 2,435 observations.

Overall, the evidence provided by the currently pledged collateral suggests that only a few banks would be adversely affected by the encumbrance treatment (i.e. without a preferential, i.e. lower, RSF) under the NSFR for longer-term central bank operations. While this may provide a justification for a preferential treatment for banks in specific jurisdictions of the euro area, a more general case cannot be derived from the available evidence.

On the one hand, this evidence highlights that a majority of banks already benefits from the TLTROs in terms of higher NSFRs. A preferential treatment may be undesirable for two reasons. First, banks may participate more in longer-term central bank operations to merely mask low NSFRs. As a result, the exit from longer-term operations may become more challenging for banks which are relatively dependent on central bank funding to meet the NSFR. Second, banks could further improve their NSFRs by changing the composition of their collateral pool. Both aspects may be undesirable for the Eurosystem. On the other hand, one should also consider that, since TLTROs have a direct link with the provision of credit to the real economy, in accounting terms loans would replace the liquidity obtained from the Eurosystem, thus raising the RSF of a bank, though at the same time creating deposits and available stable funding in the banking system. The additional impact of new lending on the NSFR due to the TLTRO is likely to be relatively contained and should thus not materially change the findings.

3.3 Leverage ratio

Following the endorsement by the Group of Governors and Heads of Supervision in January 2014 of a package of amendments to the leverage ratio framework finalising the BCBS standard, the European Commission organised a public hearing with the stakeholders. The Commission received about 60 written comment letters and contributions from banks and business associations. Respondents expressed concerns mainly on:

- the need for further clarification of the criteria to allow cash variation margin received to be deducted from the exposure value of derivatives;
- the netting of cash receivables and payables for repos and reverse repos with the same counterparty, for example a central counterparty (CCP);
- the exclusion of intragroup exposures from the exposure measure when the leverage ratio is applied at individual level.

Subsequently, on 10 October 2014, the European Commission issued the delegated regulation¹⁹ that introduced in the CRD IV framework the package of amendments decided by the GHoS in January 2014:

- a clarification that for securities financing transactions (SFTs) collateral received cannot be used to reduce the exposure value of SFTs, but that cash receivables and payables of SFTs with the same counterparty can be netted, subject to strict criteria;
- using the credit risk conversion factors (CCFs) of the standardised approach for credit risks of 0%, 20%, 50% or 100% depending on the risk category, subject to a floor of 10%, instead of the 100% weighting of off-balance-sheet exposures;

¹⁹ European Commission (2015).

- for derivatives, cash variation margin received can be deducted from the exposure value;
- written credit derivatives are measured at their gross notional amount instead of at their fair value, but fair value changes recognised as losses can be deducted from the notional amount. Also, offsetting of protection sold with protection bought is allowed, subject to strict criteria;
- the deduction from the LR of the client leg of transactions with a qualifying central counterparty (QCCP) where the institution has no obligation to reimburse the client if the QCCP would default as it does not create leverage.

Moreover, the Commission delegated act specifies that:

- The calculation and reporting period of the LR is defined as at the end of the reporting period (quarter) instead of a three-month average. This amendment aims at reducing the operational burden for institutions, but also aligning the LR with the solvency reporting data to which it should act as a backstop.
- The scope of consolidation will be the regulatory scope of consolidation used for the risk-based framework instead of the accounting scope of consolidation.
- In order to align the treatment of intragroup exposures in the LR requirements with that of the risk-based capital requirements, banks are given the possibility to exclude intragroup exposures, under certain conditions and subject to approval from the competent authority.

The final calibration of the LR will be completed by 2017, with a view to migrating to a Pillar 1 (minimum capital requirement) treatment on 1 January 2018.

4 How do European banks comply with the ratios and how have they been adjusting to regulatory change?

Several studies have analysed the development of banks' levels for the LCR, NSFR and LR, and also the factors that led to improved levels of these ratios over time. This section summarises their results, mainly drawing on studies conducted by the EBA.²⁰ The most recent study taken into account for this section is the EBA's QIS (2015b) on the LCR, NSFR and LR for euro area countries, using data as at 31 December 2014. The study covers a sample of 53 Group 1 (G1) banks²¹ and 311 Group 2 (G2) banks from 16 EU countries with total assets of €25,543 billion (100% for G1 banks and 28.5% for G2 banks).

The section also looks at how banks have already adapted to these ratios, and whether they have had a visible impact on counterparties' recourse to Eurosystem monetary policy operations. It also summarises feedback that banks provided by means of a questionnaire or via regular dialogues with national central banks (NCBs) of the Eurosystem.

4.1 Liquidity coverage ratio

In the EU, the LCR will become legally binding at 100% in 2018, eight years after it was published by the BCBS for the first time. However, according to the first EBA (2013) report, many EU banks had already become compliant with this level by 2012, although this was to a large extent driven by various recalibrations which substantially reduced the need for banks to adapt balance sheets. Based on data as at 31 December 2014, compliance with the LCR was high already, more than one year before the implementation of the delegated regulation in the EU. The weighted average LCR for the G1 banks in the sample was 124% and that of G2 banks amounted to 160%. Almost 90% of G1 banks reported an LCR of 100% or above; the corresponding value for G2 banks was 68%. Conversely, the share of banks that needed to improve their LCRs to become compliant with the 60% minimum as of October 2015 was very small: one G1 bank and 16% of G2 banks. For G1 banks, the 5th percentile and the 95th percentile amounted to about 60% and 225%, respectively. For G2 banks, the corresponding values were about 25% and above 400%, confirming that the majority of banks already met the minimum requirement. The liquidity shortfall across banks in the EU was small. The analysis assumed that liquidity was not redistributed within the EU banking sector. The liquidity shortfall amounted to €65 billion (with respect to the final 100% minimum) and €8.4 billion (with respect to the initial 60% minimum).

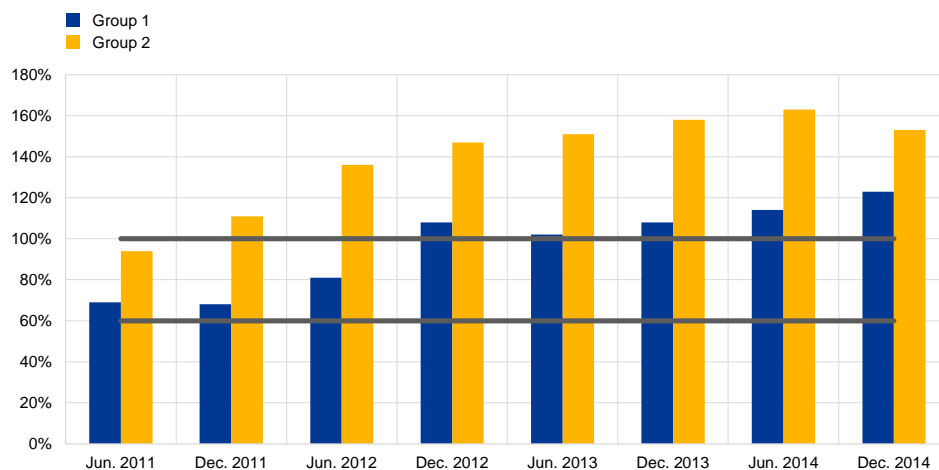
²⁰ EBA (2013, 2014, 2015a and 2015b).

²¹ Group 1 banks are banks with Tier 1 capital of more than €3 billion.

From June 2011 to December 2014, the average LCR of EU banks improved strongly. For G1 banks, it increased from 67% to 123% and for G2 banks from 84% to 153% (see Chart 3).

Chart 3

The evolution of the LCR from June 2011 to December 2014



Source: EBA (2015b), Figure 11, p. 30.

Which factors led to this improvement? The main components of in- and outflows are not available for December 2014, so the following analysis builds on the evolution of the LCR from June 2011 to June 2014. First, banks substantially reduced their total cash outflows over the period. In particular G1 banks managed to lower total cash outflows within a 30-day horizon from 19.8% to 14.6% of total assets. This sufficed to offset a decrease of total cash inflows (from 6.3% to 4.7% of total assets) and led to a material reduction in net cash outflows by 5.2% of total assets. Second, at the same time EU banks increased their HQLA by 3.8% of total assets. In sum, almost 60% of the adjustment from the fourth quarter of 2011 to the second quarter of 2014 was due to improvements in net cash outflows. For G2 banks, however, the adjustment was achieved by increases in HQLA (almost 90%). The improvement in total cash outflows amounted to 1.9% and that of net cash outflows to 0.5%.

The data do not, however, allow for a conclusion to be drawn regarding the causes of the adjustments, i.e. they were not necessarily caused by the introduction of the LCR as of October 2015 at 60%.²²

One of the main objectives of the LCR, namely the reduction of banks' dependence on credit-sensitive wholesale funding, had already been achieved, based on data as at 30 June 2014. For G1 banks, this position decreased from about €2,500 billion (Q2 2011) to about €1,700 billion (Q2 2014). For G2 banks, the decline was of a similar relative magnitude, from about €220 billion to €150 billion, i.e. by about one-third.

²² For a more detailed analysis of bank behavioural reactions to the introduction of the LCR, see EBA (2013).

However, the adjustment was largely caused by the substantial recalibration of the LCR by the BCBS in January 2013, and not only by banks' behavioural reactions. Applying the 2010 and the 2013 calibrations to data as at 31 December 2012 yields the following effects. The recalibration improved net cash outflows by 21% for G1 banks and 17% for G2 banks; it increased HQLA by 17% and 16%, respectively. As a result, the LCR improved from 84% to 125% for G1 banks and from 113% to 158% for G2 banks. Since then, G1 banks effectively reduced their LCR from 125% to 113% on 30 June 2014.

In addition, the second EBA (2014) report on the impact assessment of the LCR found that the EU delegated act of October 2014 would substantially improve compliance over time. The major modifications to Basel III are the inclusion of certain covered bonds as Level 1 assets, the inclusion of Level 2B assets (i.e. asset-backed securities) and a set of exemptions from the cap for a wide range of business models (i.e. pass-through, factoring and leasing as well as consumer and auto credit banks). The analysis is based on estimates regarding the take-up of Level 2B assets, as the available reporting data do not capture all innovations of the delegated act as of 31 December 2013. The analysis focuses on two scenarios: a conservative approach that disregards Level 2B assets, and a less restrictive approach that assumes that banks would hold as many Level 2B assets as possible under the delegated act. As such the two provide extreme values and a range within which that impact is likely to materialise in the future. The average LCR on 31 December 2013 is 116.7% based on the Capital Requirements Regulation (CRR) definition. Under the two scenarios for the delegated act, it increases to 121% (+4.3%) under the conservative scenario and to 130.6% (+13.9%) under the less restrictive scenario.

In its 2013 report, the EBA utilises comprehensive bank-level data originating from the voluntary LCR monitoring exercise and combines those with data from the NSFR and LR templates submitted by the same sample of banks in the BIS QIS.²³

In this report, the EBA employs two approaches to the multivariate analysis. The first focuses on changes of banks' LCR in percentage points between the second quarter of 2011 and the fourth quarter of 2012. The second approach focuses only on improvements of the LCR that led to the transition of banks from non-compliant status (in the second quarter of 2011 assuming a 100% minimum LCR level) to compliance in the fourth quarter of 2012.

The independent variables in both approaches capture changes in banks' balance sheet structures over the same period. Similarly to the other variables, such as non-financial corporate lending, retail and SME lending, and trade finance, CET1 (Common Equity Tier 1), the NSFR and the LR are expressed as a share of total assets. The changes of these shares across the sample constitute the independent variables.

The multivariate analysis yields the following results:

²³ The data analysis (see EBA (2013), Technical Appendix 2.2 for details) employs a multivariate approach to the available data, and aims at identifying the major drivers of changes of the LCR at bank level (i.e. non-financial corporate lending, retail and SME lending and trade finance).

- The increase in HQLA (particularly central bank reserves, local sovereign debt with 0% risk weights and covered bonds/bonds of supranational institutions) and both the lengthening and staggering of the maturity of deposits from non-financial corporates and retail and SME customers provide the most robust insights.
- The data reject the hypothesis that banks would cut back lending to non-financial corporates and retail and SME customers or reduce trade finance exposure due to the LCR. In the second approach (based on the transition from non-compliant to compliant) increases in the share of loans to non-financial corporates even increased the probability of a bank becoming LCR compliant.
- The analysis rejects the hypothesis that other regulatory ratios (CET1, LR and NSFR) or their changes interact significantly with changes of the LCR or the transition from non-compliance to compliance or that they impose significant restrictions on the adjustment of banks in the sample. The control variables are insignificant in both approaches.

The results are robust across both approaches to the dependent variable.

EBA (2014) extends the econometric analysis conducted in EBA (2013) to cover the adjustments during the year 2013. It finds that the only significant factor leading to LCR improvements for these banks is the increase of central bank reserves.

Similar results are reported based on surveys among banks. Zeb/ (2013)²⁴ published a study on the impact of the LCR on banks which also covered their behavioural reactions.

According to that survey, 90% of respondents had an LCR at the consolidated level above 60% (based on the GHoS calibration of 6 January 2013) and 50% had an LCR above 100% at the end of 2012. Banks targeted different levels for the LCR: roughly one-third targeted an LCR of 111-120%, one-third aimed at above 121% and the remaining third planned an LCR slightly above the regulatory minimum of 100%.

More than half of the banks had already studied the impact of the LCR on their business model and their business strategy. Around half of these banks expected effects on their profit and loss account, balance sheet, business model and strategy. The negative effects on profitability were considered to be due to the opportunity cost of HQLA (83%), the lengthening tenor of liabilities (52%), the increase in stable deposits (17%) and the reduction of committed liquidity and credit lines (13%). Among the respondents, 53% expected no or only a small impact on profitability and 5% a strong impact, the remainder expecting a medium impact. G2 banks reported a larger impact than G1 banks. Banks' major strategies in order to become compliant were reductions of unsecured outflows (86%), increases of Level 1 HQLA (76%) and increases of Level 2 HQLA (38%). Respondents also planned to cut committed credit and liquidity lines (33%) and secured outflows (33%).

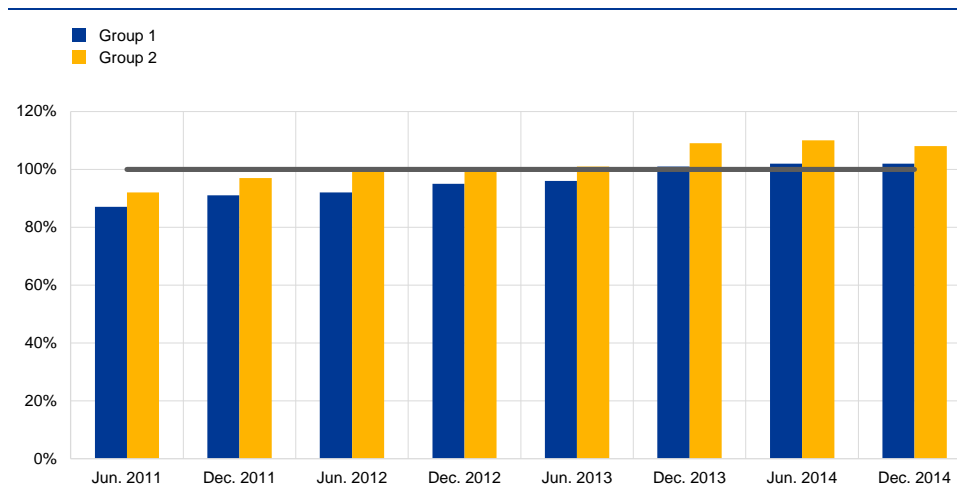
²⁴ zeb/ (2013). The survey covered 23 banks in Austria and Germany, of which nine G1 banks and fourteen G2 banks, featuring different business models such as cooperative banks, savings banks, internationally active universal banks, specialised banks and direct banks.

4.2 Net stable funding ratio

Based on the EBA's (2015b) QIS using December 2014 data, EU banks on average were compliant with the NSFR more than three years before its planned application (January 2018). The EBA analysis of EU banks' compliance with the NSFR is based on a sample of 233 banks. For G1 banks the ratio stood at 102% and for G2 banks the respective value was 109%. About 60% of G1 and 75% of G2 banks were already compliant. Banks that were not yet compliant would require an additional €523 billion of stable funding or about 4.5% of total assets of participating banks. This number does not take into account the potential flow of stable funding across the EU banking sector. Over the period from the second quarter of 2011 to the fourth quarter of 2014, EU banks improved their NSFR substantially. For G1 banks it increased from 87% to 102% and for G2 banks from 92% to 108%. The NSFR recalibration agreed by the GHoS members is likely to have contributed to this improvement. As a consequence, the EU banking system was no longer constrained in terms of the NSFR.

Chart 4

The evolution of the NSFR from June 2011 to December 2014



Source: EBA (2015b), Figure 16, p. 37.

4.3 Leverage ratio

The average LR for the 38 G1 banks in the EBA sample was 4.5% based on the CRD IV capital definition as at June 2014²⁵. None of the G1 banks had a capital shortfall. Assuming the full implementation of Basel III the ratio was 3.9% and the corresponding capital shortfall amounted to €2.4 billion. For the 97 G2 banks the average LR was 5.2% under June 2014 definitions and 4.9% fully fledged. The Tier 1 capital shortfall was €3.2 billion and €3.7 billion, respectively. Compliance with the 3% minimum was already very high (89% for the total of G1 and G2 banks), although the LR will only become binding in 2018.

²⁵ EBA (2015a).

The variation among G2 banks was higher than that among G1 banks. The 5th and 95th percentiles for G1 banks were about 2.6% and 6%, respectively. For G2 banks the corresponding values were 2.1% and 10.4%. The LR of EU banks in the sample increased strongly over the period from June 2011 to June 2014. For G1 banks it rose from 2.7% to 3.9% and for G2 banks from 3.2% to 4.9%. The Tier 1 capital shortfall dropped sharply over the period. For G1 banks it vanished almost completely and for G2 banks it fell by 69%.

4.3.1 Banks' reactions to the leverage ratio: changes in repo activity and Eurosystem borrowing

Banks in the euro area are rapidly adjusting to the Basel III LR, although the implementation of the new requirement in the European Union is still under way.

Using data from Bankscope and SNL Financial, LR estimates have been computed for a sample of 70 banking groups in the euro area over the period 2013-14 (Table 7), focusing on the following dates:

- June 2013, when the BCBS issued a public consultation document on LR revision which paved the way for a tightening of the rule;
- June 2014, following the BCBS recalibration of the LR in January 2014; and
- December 2014, following the EU delegated act of October 2014 and in view of the Basel III publication date of January 2015, and also including the effects of participation in the first two TLTROs.

Table 7
Sample of banks as a share of total bank assets

Country	No of banks	Total assets in June 2014	
		€ billions	% of country total bank assets
Austria	6	443	49
Belgium	3	721	67
Germany	17	4,303	57
Spain	5	2,358	76
Finland	2	424	77
France	6	6,387	80
Ireland	3	288	28
Italy	11	2,157	54
Netherlands	8	2,030	87
Portugal	3	222	45
Other *	6	130	11
Total	70	19,464	64

*Consisting of: Cyprus, Estonia, Luxembourg, Malta, Slovenia and Slovakia.

4.3.1.1 Banks' actions to reach the 3% LR level

The LR estimates are based on the January 2014 BCBS definition, under the assumption that the new rules are fully implemented. Although banks will only have to comply with the LR requirement from 2018, by mid-2014 the majority of banks already showed a ratio above 3% (Table 8).

Table 8

Average LR, estimated shortfall in terms of the number of banks below the threshold and volume, by country

Country	Average LR		Estimated shortfall No of banks		Estimated shortfall €billions	
	30 June 2013	30 June 2014	30 June 2013	30 June 2014	30 June 2013	30 June 2014
AT	4.5	5.5	1	0	0.1	0
BE	3.8	5.9	1	0	0.8	0
DE	2.4	3.5	11	4	34.6	2.8
ES	3.2	4.2	3	0	3.1	0
FI	2.3	3.0	1	1	3.9	1.9
FR	2.8	3.5	4	1	17.4	0.8
IE	4.0	4.1	0	1	0.6	0.3
IT	4.5	5.4	1	0	0.0	0
NL	3.8	4.1	2	0	0.8	0
PT	4.6	5.3	0	0	0	0
Other	5.5	6.8	2	0	0	0
Total	3.1	4.0	25	7	61.3	5.8

The pace of adjustment appears to have intensified. Compared with June 2013, in June 2014 the number of banks in our sample which would not meet the 3% LR level had decreased from 25 to 7. Over the same period, the estimated capital shortfall which would be needed to bring the LR to 3% fell from €61.3 billion to €5.8 billion.

Six of the seven banks with an estimated LR below 3% in June 2014 are well capitalised, according to the harmonised minimum capital requirements that came into effect in the EU in January 2014, assuming their full implementation and also including the additional capital requirements that banks would need to fulfil (the capital conservation buffer and the loss-absorbency requirements for global systemically important banks (G-SIBs)). The capital shortfall in those six cases is entirely attributable to the LR requirement, which is therefore binding.

At the individual bank level, it is evident that the improvement in LR levels has been predominantly driven by capital increases. The capital effect is larger than the exposure effect irrespective of the LR at the start of the period and of the sign of the change in the overall LR measure.

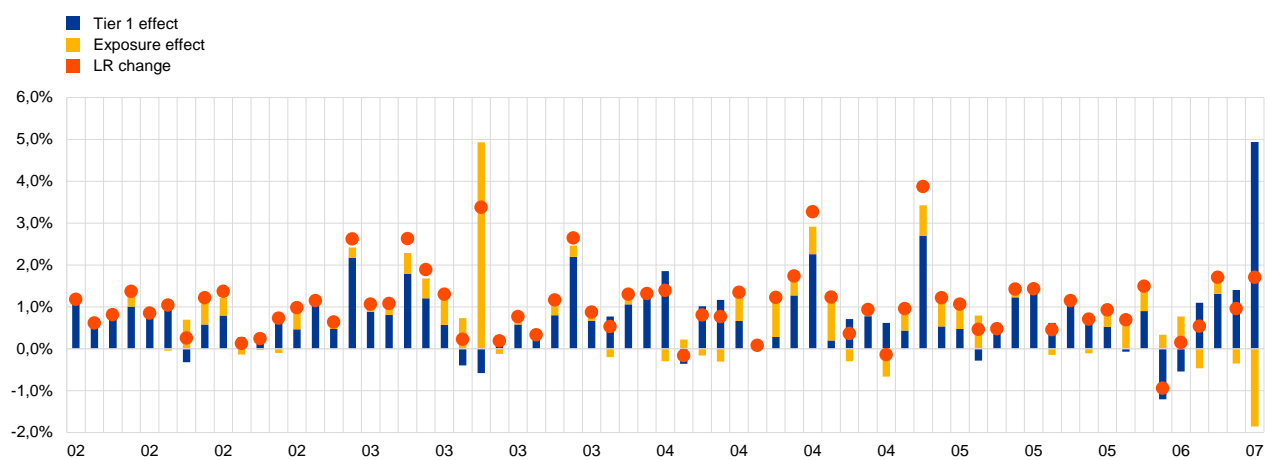
The euro area banks in Chart 5 are arranged on the horizontal axis according to estimated LRs in June 2013. There appears to be no evidence of banks with a low LR having adopted a different strategy compared with those with high ratios. This

evidence suggests that banks have concentrated their efforts on strengthening their regulatory capital and that the improvement of the LR is ancillary to this process.

It is interesting to note, however, that the reduction in exposure is significant for banks which experienced negative changes in their Tier 1 capital over the period, suggesting that in cases where capital has decreased, an effort has been made to counteract the effect on the LR by reducing exposure. Conversely, it appears that banks with high LR starting levels and large capital increases chose to expand their balance sheet (negative contribution of the exposure effect to the overall LR change).

Chart 5

Changes in LR levels between June 2013 and June 2014: Tier 1 component and exposure component



Source: Banca d'Italia calculations.

4.3.1.2 Has the LR improvement led banks to reduce trading in the repo market?

To investigate possible negative effects of the LR adjustment process on repo market activity, two datasets were used: (i) banks' balance sheet data on repos and reverse repos; and (ii) the ECB Money Market Survey data²⁶ on secured transactions for the second quarter of 2013 and the second quarter of 2014, providing information on borrowing and lending flows of major euro area intermediaries.

The size of repos (cash borrowing) and reverse repos (cash lending) as reported in the balance sheets on 30 June 2014 was compared with the corresponding balance sheet items on 30 June 2013.

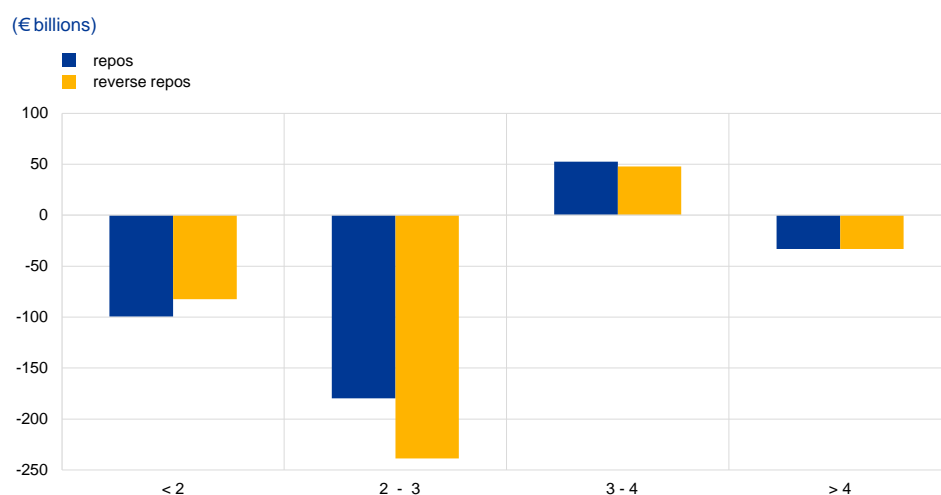
The sample banks were divided into four classes according to their estimated LR in June 2013 and changes in the banks' reported amount of repos and reverse repos between June 2013 and June 2014 were computed (Chart 6). It is evident that banks which did not meet the 3% threshold in June 2013 have substantially decreased repo

²⁶ ECB (2014b).

lending outstanding as at June 2014, whereas those with $3 < LR \leq 4$ have moved in the opposite direction, albeit by smaller amounts. The data also show that banks with a low LR have reduced their repo funding. Other things being equal, this might imply an attempt by banks to improve their LRs by acting on liabilities as well as on assets in order to contain the size of the balance sheet.

Chart 6

June 2013 LR levels and changes in secured transaction stocks between the second quarter of 2013 and the second quarter of 2014



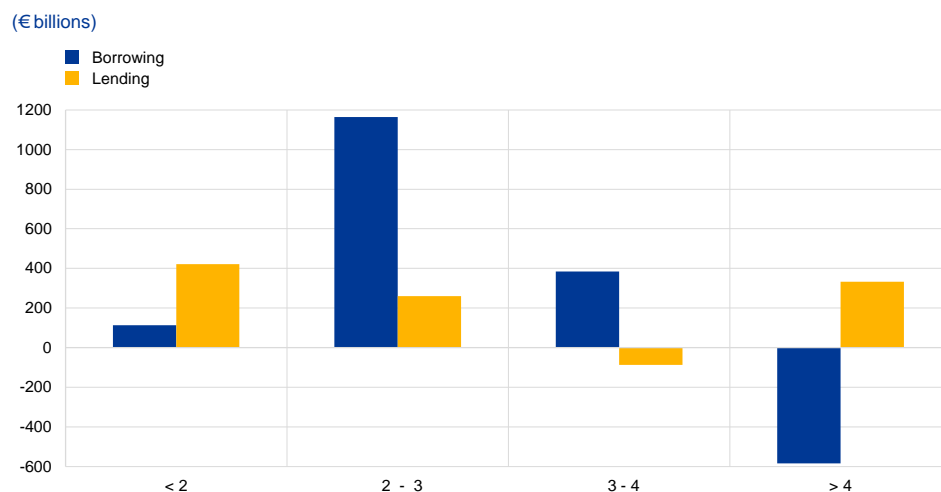
Source: Banca d'Italia calculations.

The adjustment in repo stocks at the reporting dates does not necessarily imply a reduced participation in market activity, i.e. in repo flows, by individual banks. There are 44 banking groups belonging to the sample in Table 7 which are also included in the ECB Money Market Survey. For the sample, as for the market as a whole, trading recovered after the most acute phase of the financial crisis: from the trough in the second quarter of 2012 to the second quarter of 2014, lending volume rose from €7.4 trillion to nearly €10 trillion, whereas borrowing increased from €13.3 trillion to €14.9 trillion. Although the increase in lending was more noticeable than that in borrowing, the sample banks are predominantly active as borrowers in the secured money market, accounting for 75% of total repo transactions and 67% of total reverse repo transactions by banks in the second quarter of 2014.

Chart 7 shows the changes in repo lending and repo borrowing for the sample banks in the second quarter of 2014 relative to the second quarter of 2013 and compares these changes with the level of each bank's LR in June 2013. The same banks, with a "very low" initial LR (<2%, 5 banks) and a "low" LR (between 2% and 3%, 12 banks), which report a contraction in repo stocks (Chart 6), show an increase in their lending and borrowing activity in the repo market. For comparison, the banks with a "high" ratio ($3 < LR \leq 4$, 12 banks) and those with a "very high" ratio ($LR > 4$, 15 banks) increased their overall turnover by a smaller amount, while actually reducing their borrowing.

Chart 7

June 2013 LR levels and changes in secured transaction flows between the second quarter of 2013 and the second quarter of 2014



Source: Banca d'Italia calculations.

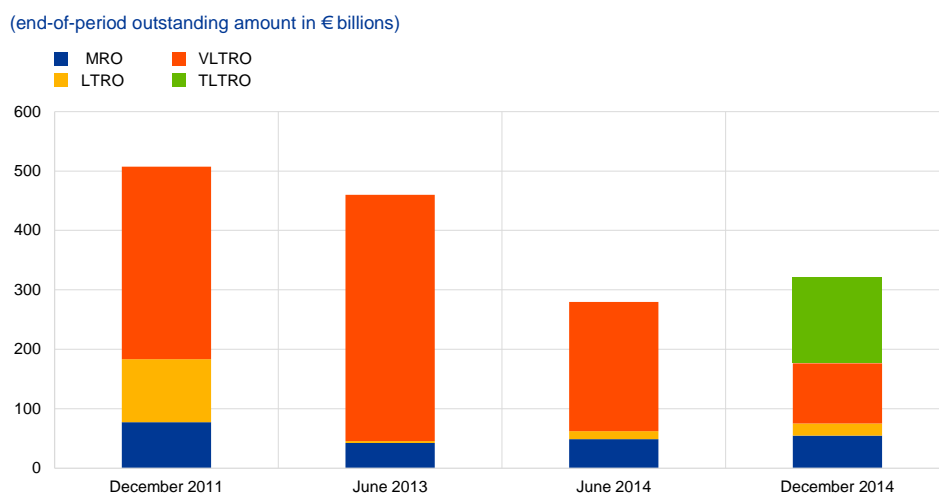
There is evidence that banks exhibiting low LR levels in June 2013 had significantly reduced outstanding repo lending by June 2014. However, the observed reduction in repo stocks is accompanied by an increase in individual market turnover, indicating that the LR convergence process per se is not having a depressing effect on the repo market.

4.3.1.3 Has the LR influenced banks' participation in Eurosystem refinancing?

The LR makes no special allowance for reserves obtained via central bank refinancing. Hence LR-constrained banks might in principle be reluctant to participate in central bank repo operations, like in private repo trades, thus possibly reducing the effectiveness of monetary policy transmission. Since December 2011 the sample banks have reduced their borrowing from the Eurosystem (Chart 8); the contraction accelerated between June 2013 and June 2014, in parallel with the large improvement in the LR.

Chart 8

Sample banks' borrowing from the Eurosystem



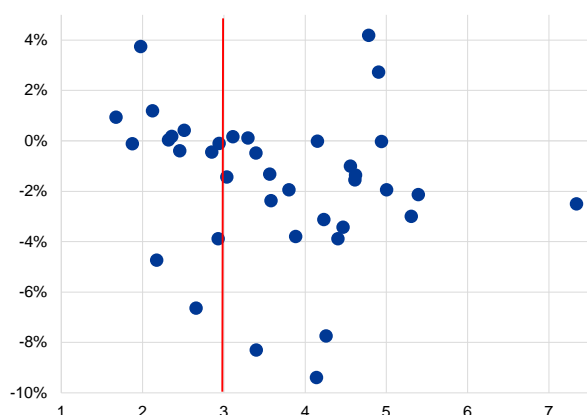
Source: Banca d'Italia calculations.

Although a large number of factors combine in determining banks' lower Eurosystem borrowing, there might also be a role for the concern of LR-bound banks not to increase their balance sheet. Chart 9 compares the changes in Eurosystem borrowing from June 2013 to June 2014, as a percentage of each group's June 2013 exposure, with the estimated LR in June 2013. No noticeable differences can be discerned between LR-bound banks and those with an LR above the 3% threshold.

Chart 9

Changes in Eurosystem borrowing and the LR level as at 30 June 2013

x-axis: LR (%) as of June 2013
y-axis: borrowing change as % of exposure

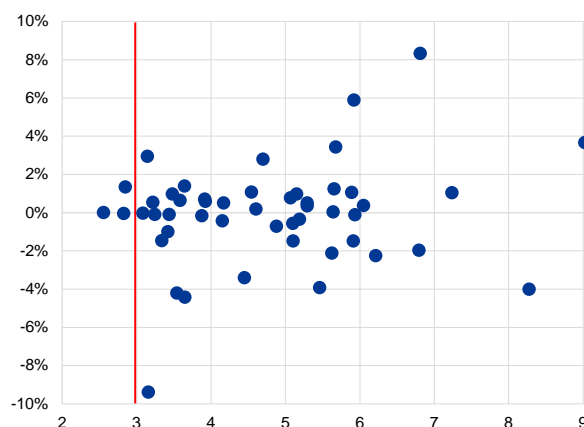


Source: Banca d'Italia calculations.

Chart 10

Changes in Eurosystem borrowing and the LR level as at 30 June 2014

x-axis: LR (%) as of June 2014
y-axis: borrowing change as % of exposure



Source: Banca d'Italia calculations.

Conversely, in the second half of 2014, after achieving a considerable improvement in their LR, banks increased their Eurosystem borrowing mainly via recourse to the TLTROs. Chart 10 suggests that banks with an LR well above the 3% threshold

increased their borrowing by a larger amount than those which were still close to or below the threshold.

To sum up, during 2013 and the first half of 2014 the majority of banks in the euro area raised their LR above the reference level of 3%, largely as an effect of the capital increases required by compliance with higher standards from January 2014. In June 2014 only 7 banking groups out of 70 still showed an LR below 3%, indicating that for those banks the LR remained a binding requirement.

The LR improvement until June 2014 was also achieved via a large reduction in repo borrowing from the Eurosystem. Against the backdrop of the newly reached LR levels, this requirement posed a mild constraint on individual participation in the TLTROs that were conducted in the second half of 2014.

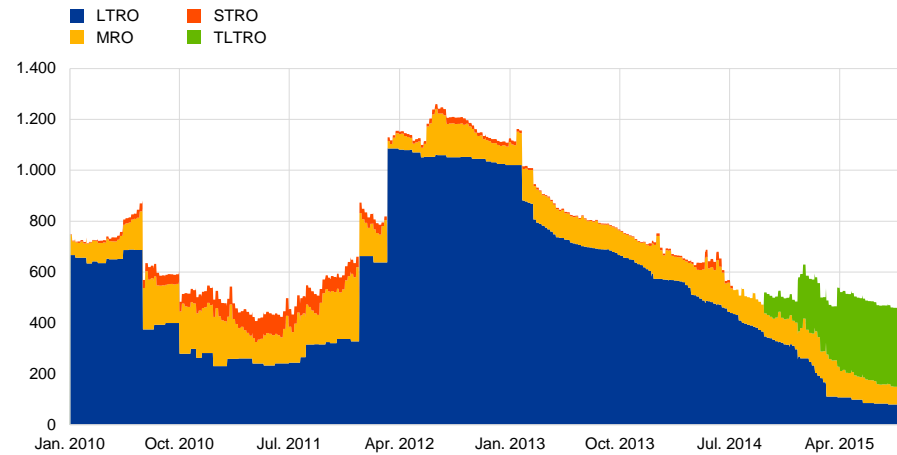
Overall, these findings allay two concerns that have often been raised on the LR requirement, namely that it would have a negative impact on the repo market as well as on participation in central bank repos, thus possibly hampering the transmission of monetary policy. To the extent that some remaining banking groups with a shortfall will reach the minimum LR threshold, these concerns could be further alleviated.

4.4 Banks' recourse to monetary policy operations

Based on aggregate data, banks' recourse to Eurosystem open market operations does not indicate a significant impact of specific regulations. Recourse to Eurosystem open market operations has been continuously declining since its peak in July 2012 both for LTROs and for MROs (Chart 11). Excess liquidity had steadily fallen, mainly owing to the repayment of the three-year LTROs, which can be attributed to an improvement in market sentiment. Beyond this overall development, it is difficult to identify a trend that would signal increased recourse to central bank liquidity operations motivated by regulatory initiatives. Hence, it is difficult to draw any definitive conclusions given that the impact of regulation is intermingled with other events that are simultaneously at play (i.e. market fragmentation, changes in investor sentiment, stigmatisation of certain operations, etc.).

Chart 11 Outstanding Eurosystem operations

(Jan. 2010 – Aug. 2015, € billions)



Source: ECB calculations.

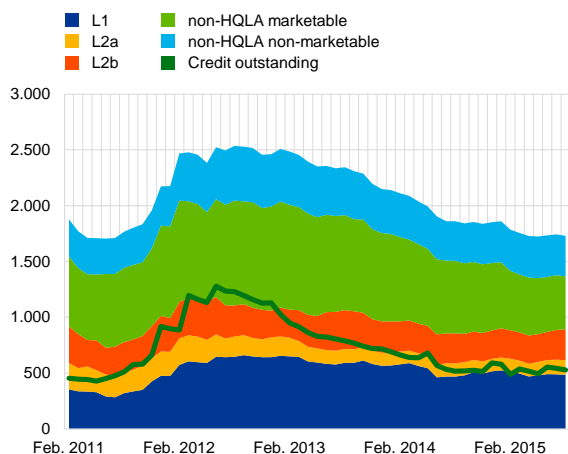
While on aggregate there is no evidence for the suggested reaction pattern, this does not exclude that some banks – presumably those that fell short of fulfilling the required ratios – did indeed make use of central bank liquidity-providing operations in order to boost LCR levels.

As regards the predicted change of collateral composition, i.e. a shift from HQLA to non-HQLA, there is no clearly visible trend. The banking sector on aggregate was sufficiently collateralised in order to secure the total amount of outstanding credit operations with non-HQLA only (Chart 12). The overall amount of collateral outstanding declined in line with credit outstanding, which affects non-HQLA as well.

Since the end of 2013, there seems to be a declining trend in the share of non-HQLA marketable collateral (Chart 13), but an increase in the share of non-HQLA non-marketable collateral.

Chart 12**Eurosystem aggregate use of collateral by liquidity class**

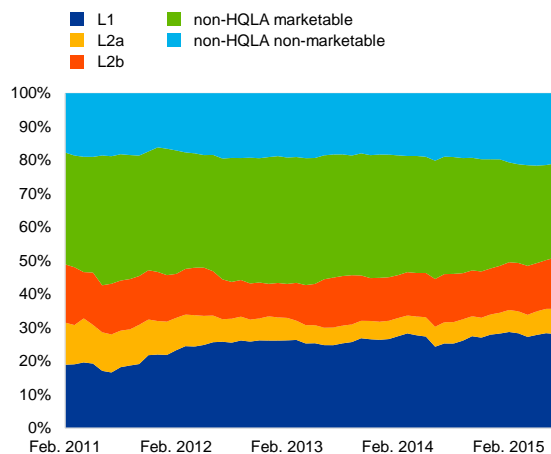
(Feb. 2011 – Aug. 2015, collateral values after haircuts, € billions)



Source: ECB calculations.

Chart 13**Eurosystem collateral composition by HQLA category**

(Feb. 2011 – Aug. 2015, collateral values after haircuts, € billions)

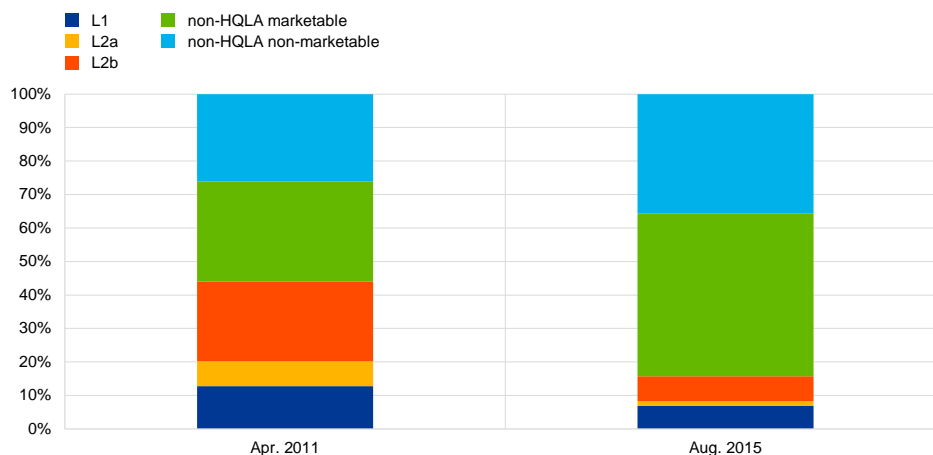


Source: ECB calculations.

If, however, one looks only at those banks that have a significantly higher than average share of non-HQLA collateral in their pools, the picture looks different. Chart 14 depicts the collateral composition of banks with more than 70% non-HQLA in their pools at end-August 2015 and compares it with the collateral composition of the same banks four years earlier. Two things are striking: first, on average, these banks have a share of non-HQLA of almost 90%, which is extremely high compared with roughly 60% for the Eurosystem aggregate, and, second, this share had been much lower, i.e. approximately 60%, four years earlier. While this may also be driven by other factors, it could be an indication of banks' usage of Eurosystem credit operations in order to achieve higher LCR levels.

Chart 14**Change in collateral composition for banks with more than 70% non-HQLA in 2015**

(collateral values after haircuts)



Source: ECB calculations.

4.5 Banks' feedback on Basel III liquidity and leverage regulations

This section summarises feedback provided by credit institutions on Basel III liquidity and leverage regulations by means of a questionnaire, as well as regular formal and informal dialogues with the NCBs. Observations were gathered from counterparties across certain euro area countries which account for the majority (86%) of current Eurosystem borrowings.

4.5.1 Banks' adaptation process

As the NSFR and the LR will not become binding for several more years, implementation of the LCR has taken priority across counterparties due to the minimum level that had to be complied with in October 2015. The full impact of the NSFR and the LR is expected to be seen as the binding dates approach.

Broadly all counterparties shared the view that the whole financial sector is aware of the importance of complying with the ratios before they become binding, with some counterparties already reporting the new ratios in their strategic plans and financial statements. In addition, many counterparties noted the adverse impact on profitability of holding HQLA in the current low-yield environment.

As regards the adjustments that were made in order to prepare for the fulfilment of the ratios, most counterparties stated that the significant deleveraging/balance sheet decrease undertaken to date had ensured that the new requirements had generally not required any major deliberate actions to meet the ratios. It was also noted that the increase in the share of retail funding, the reduced reliance on wholesale funding (which typically now also has a longer maturity) and the retention of a larger pool of highly liquid assets (in response to the financial crisis in the euro area) played an important role in adjusting to the liquidity regulations in advance.

In addition, counterparties mentioned that the national liquidity regulations applied in their jurisdictions prior to the introduction of the Basel III requirements had some similarities with the new liquidity regulations, and therefore did not necessitate a major change in behaviour to achieve compliance with the ratios.

However, going forward, counterparties consider that both asset origination and funding are now assessed and priced according to the impact on these ratios.

It was reported that at a technical/operational level, the required IT adjustments were challenging, as the information for computing the ratios and monitoring intraday liquidity was not readily available.

4.5.2 Funding markets

Activity in the unsecured interbank funding market has not returned to pre-crisis levels, and certain features of the ratios make this form of lending more onerous. As

a likely consequence, this is expected to lead to an increase in segmentation with respect to maturity (below versus beyond 30 days). Unsecured money market transactions with a term of less than 30 days affect the LCR numerator and denominator in a similar fashion, thus, in principle, having a neutral effect on the ratio.²⁷ Unsecured transactions with a term of more than 30 days change the LCR. For example, if a bank lends funds with a maturity of six months, there is a decline in the LCR numerator and therefore in the LCR as a whole because the contractual inflow is not expected to accrue until it comes within the 30-day horizon, leaving the LCR denominator unchanged. The LCR therefore may tend to add an additional term premium in the unsecured money market. It is not expected that unsecured interbank activity will return to pre-crisis levels, in part due to the new liquidity standards.

As regards the repo market, counterparties mentioned that there might be a shift from unsecured to secured activity. Even so, activity in the repo market is expected to be adversely impacted owing to:

- the asymmetric LCR treatment of repos, whereby collateral received in a reverse repo is subject to a less favourable treatment than cash;
- the negative treatment of repos for the LR computation. In this context, it was commented that higher minimum LRs adopted by supervisory authorities in countries outside the euro area can curtail repo activity by counterparties based in those countries over key reporting periods such as quarter and year-ends;
- the fact that counterparties might be less likely to encumber Level 1 HQLA as this will reduce the extent that Level 2 HQLA can be used to meet the LCR requirement (as they may only comprise 40% of total HQLA);
- the fact that counterparties might adjust their collateral baskets, with a preference for central bank eligible assets, increasing the segmentation with respect to collateral.

Other potential implications are that the recognition of Level 2 assets in the LCR, albeit with haircuts and caps, could provide an incentive to mobilise such assets that are less liquid (e.g. corporate bonds, covered bonds) as collateral with the Eurosystem. These developments are seen by counterparties as being beneficial in terms of transaction volumes and as being beneficial for borrowers by lowering costs.

Finally, counterparties generally shared the view that, at least in theory, the disclosure of the compliance with the ratios may, by itself, be a factor benefiting an institution's access to the interbank unsecured and repo markets, with better pricing conditions in the medium term.

²⁷ Assuming that the ratio at the outset is near to its threshold value of 100% and that both the floors of the liquidity buffer for Level 1 HQLA and the cap on denominator inflows are not yet reached.

4.5.3 Interactions with Eurosystem monetary policy

Recourse to the Eurosystem

Counterparties mentioned that some regulatory arbitrage is possible, in particular for the LCR. For example, usage of the marginal lending facility or the MROs in order to improve the LCR on reporting days may take place.

It was noted that the demand for central bank funding might increase in the future, as it is a way to improve the LCR by transforming non-HQLA (but central bank eligible) assets into HQLA (cash).

Participation in the TLTROs has been mainly driven by the low cost and duration of the operations, while the impact on the NSFR was a secondary consideration. However, going forward, counterparties expect ongoing demand for central bank operations such as the TLTROs that provide long-term funding to address compliance with the NSFR.

Collateral pledged

According to the majority of counterparties, their collateral management processes already incorporate the objective to preserve sufficient LCR-eligible assets from encumbrance. In this way, counterparties expect to pledge non-HQLA collateral with the Eurosystem and to retain HQLA collateral for LCR purposes.

Interactions with the Eurosystem expanded asset purchase programme

Counterparties are generally reluctant to sell HQLA to the Eurosystem APP, which would instead be retained to meet the LCR. If counterparties were to sell assets to the purchase programme, the proceeds would have to be reinvested in a lower rate environment, as the cost of holding cash is too prohibitive. In fact, according to counterparties, the APP may not achieve the intended portfolio rebalancing effect through a revamping of the risk-taking channel as banks that are LCR-constrained will have no incentive to change HQLA into less liquid assets with higher run-off rates.

Counterparties expect that the APP will further lower the yields of HQLA, with negative consequences for the profitability of LCR-eligible assets. Therefore, counterparties commented on the adverse impact of holding HQLA in a low (even negative) rate environment, which may need to be compensated for by higher lending margins.

On the other hand, it was noted that both the NSFR and the LR could benefit from the APP, mainly because counterparties will be able to reduce their balance sheet

size through the sale of sovereign debt securities (if not needed to comply with the LCR), resulting in lower capital and funding requirements (assuming that the proceeds are used to reduce liabilities).

Committed liquidity facility

Counterparties expressed support for such a facility, but outlined that it would only be used on a contingency basis (and conditional on the cost of the facility). Counterparties also referred to the existing expanded collateral framework (which includes non-HQLA) and the fixed rate full allotment procedure as providing a sufficient liquidity backstop.

Deposits with the Eurosystem

Counterparties mentioned that, owing to the negative remuneration, they closely manage their reserve requirements to avoid holding excess reserves and they do not plan to place funds on the deposit facility. Consequently, they do not envisage increasing the deposits with the Eurosystem for LCR purposes.

4.5.4 Concerns and challenges

One challenge which was noted by counterparties is the ability to strike an appropriate balance between liquidity requirements and maintaining profitability. This is particularly due to the fact that holding a buffer of liquid assets and longer treasury positions implies lower profitability and retained earnings. This impact on profitability was, in fact, one of the major concerns expressed by the majority of counterparties.

Counterparties also noted that sometimes the intended effects of the three ratios seem to run in opposite directions. For instance the LR, being a function of capital, will have conflicting effects with the LCR and the NSFR, as it will be adversely impacted by any asset increment (an increase in HQLA improves the LCR but reduces the LR).

Furthermore, the varying degrees of difficulty in complying with the ratios depending on the business model were noted. Wholesale banks may find the NSFR more difficult to comply with (owing to the lack of a deposit base), while holding sufficient (HQLA) treasury assets to comply with the LCR. Retail banks would be better placed to achieve NSFR compliance (owing to a retail deposit base) but may need to increase HQLA holdings for the LCR.

Finally, some counterparties outlined that the prudential value of customer deposits in achieving compliance with the liquidity ratios limits the pass-through of negative interest rates to corporate and retail customers.

4.5.5 Summary of counterparties' feedback

Counterparties have prioritised implementation of the LCR, and the deleveraging undertaken in previous years has helped in this process. The LCR may confine longer-term unsecured money market activity, while repo markets could potentially be affected owing to a higher capital requirement arising from the LR and an increase in collateral segmentation depending on the HQLA classification. Counterparties may have tactical recourse to Eurosystem borrowings over reporting periods to meet the LCR, while (Eurosystem-eligible) non-HQLA collateral may also be posted to help counterparties meet this requirement. Many counterparties seem unlikely to sell HQLA to the Eurosystem's asset purchase programmes, preferring instead to retain such assets to meet the LCR. However, this can lead to a decline in profitability when maintaining HQLA holdings in a low interest rate environment.

5 Conclusion

The majority of European banks already comply with the minimum levels for the LCR, NSFR and LR required by Basel III, even though full implementation dates are still some way in the future. Some have started to adapt to these regulatory changes by deleveraging, reporting the ratios in their financial statements or changing collateral management processes with the objective of preserving sufficient LCR-eligible assets from being encumbered, for example.

Based on aggregate data, possible unintended effects on monetary policy operations, such as increased demand for Eurosystem liquidity-providing operations and a shift away from using HQLA towards using non-HQLA in collateral pools for Eurosystem credit operations, have so far not become evident.

The data, however, also reveal that banks with very high usage of non-HQLA as collateral at present have indeed increasingly used non-HQLA rather than HQLA as collateral over the past four years. While this phenomenon may be the result of several concurrent factors, it seems to indicate that the banks concerned achieved higher LCR levels via increased usage of Eurosystem credit operations.

A case study on the LR shows that two further effects, namely reduced trading activity in secured markets and the deterrence of LR-constrained banks from using central bank repos, cannot be confirmed using individual data up to 2014.

While banks exhibiting low LR levels reduced repo lending stocks at the end of June 2014, as expected, this reduction was accompanied by an increase in individual market turnover during the previous months, indicating that the LR convergence process did not have a depressing effect on the repo market and that banks were able to perform some sort of window-dressing, as long as the LR is measured on a point-in-time basis.

Improved levels of the LR in the sample period have been accompanied *inter alia* by a large reduction in repo borrowing from the Eurosystem. However, against the backdrop of the newly reached LR levels, this requirement posed a mild constraint on individual participation in the TLTROs in the second half of 2014 and probably even less thereafter. Recent figures on declining turnover in the secured money market however signal that the potential regulatory impact on repo market activity needs to be further monitored²⁸.

Overall, the impact of the regulatory changes on monetary policy implementation seems contained so far. Going forward, the Eurosystem will need to continue to closely monitor the impact of regulatory changes on market functioning and on banks' behaviour, in order to ensure that regulatory arbitrage by banks does not hinder the smooth implementation of monetary policy. Under the currently used fixed rate full allotment procedure for Eurosystem tender operations, whereby all liquidity demand by the banking sector is fully satisfied, and in an environment of excess

²⁸ See Euro Money Market Survey 2015 (ECB 2015).

liquidity with the Eurosystem's asset purchase programme, the predicted effects on access to central bank operations cannot be observed at an aggregate level. Expected developments might, however, become more evident should the Eurosystem abandon the fixed rate full allotment and revert to competitive tender procedures, or when the 1 January 2018 date of entry into force of the 100% LCR requirement gets closer.

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Abbreviations

ABS	asset-backed security
ASF	available stable funding
APP	expanded asset purchase programme
BCBS	Basel Committee on Banking Supervision
CCP	central counterparty
CET1	common equity Tier 1
CGFS	Committee on the Global Financial System
CMBS	commercial mortgage-backed security
CRD IV	Capital Requirements Directive IV
CRR	Capital Requirements Regulation
EBA	European Banking Authority
ECAI	external credit assessment institution
GHoS	Group of Governors and Heads of Supervision
G1 banks	Group 1 banks
G2 banks	Group 2 banks
G-SIB	global systemically important bank
HQLA	high-quality liquid assets
LCR	liquidity coverage ratio
LR	leverage ratio
LTRO	longer-term refinancing operation
MRO	main refinancing operation
MRR	minimum reserve requirements
NSFR	net stable funding ratio
QCCP	qualifying central counterparty
QIS	Quantitative Impact Study
RMBS	residential mortgage-backed security
RSF	required stable funding
SFT	securities financing transaction
SMEs	small and medium-sized enterprises
STRO	special term refinancing operation
TLTRO	targeted longer-term refinancing operation
VLTRO	very long-term refinancing operation

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Annalisa Bucalossi

Banca d'Italia; email: annalisa.bucalossi@bancaditalia.it

Cristina Fonseca Coutinho

Banco de Portugal; email: cfcoutinho@bportugal.pt

Kerstin Junius

European Central Bank; email: Kerstin.Junius@ecb.int

Alaoishe Luskin

Central Bank of Ireland; email: alaoishe.luskin@centralbank.ie

Angeliki Momtsia

Bank of Greece; email: AMomtsia@bankofgreece.gr

Imene Rahmouni-Rousseau

Banque de France; email: Imene.rahmouni-rousseau@banque-france.fr

Benjamin Sahel

European Central Bank; email: Benjamin.Sahel@ecb.int

Antonio Scalia

Banca d'Italia; email: antonio.scalia@bancaditalia.it

Stefan Schmitz

Oesterreichische Nationalbank; email: stefan.schmitz@oenb.at

Franziska Schobert

Bundesbank; email: franziska.schobert@bundesbank.de

Rita Isabel Prior Soares

Banco de Portugal; email: risoares@bportugal.pt

Michael Wedow

European Central Bank; email: Michael.Wedow@ecb.int

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Postal address 60640 Frankfurt am Main, Germany
Telephone +49 69 1344 0
Website www.ecb.europa.eu

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