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On the liquidity coverage ratio and monetary policy implementation[1]

Basel III introduces the first global framework for bank liquidity regulation. As monetary policy typically involves targeting the interest rate on interbank loans of the most liquid asset – central bank reserves – it is important to understand how this new requirement will impact the efficacy of current operational frameworks. We extend a standard model of monetary policy implementation in a corridor system to include the new liquidity regulation. Based on this model, we find that the regulation does not impair central banks' ability to implement monetary policy, but operational frameworks may need to adjust.

JEL classification: E43, E52, E58, G28.

In response to the recent global financial crisis, the Basel Committee on Bank Supervision (BCBS) published a new international regulatory framework, known as Basel III, in December 2010 (BCBS (2010)). In addition to strengthening the existing bank capital rules, Basel III introduces – for the first time – a global framework for liquidity regulation. A key part of the framework is the liquidity coverage ratio (LCR), which requires banks to hold a sufficient stock of highly liquid assets to survive a 30-day period of market stress. The LCR is scheduled to be implemented in January 2015.

The new liquidity regulation is likely to impact the process through which central banks implement monetary policy. In many jurisdictions, this process involves setting a target for the interest rate at which banks lend central bank reserves to one another, typically overnight and on an unsecured basis. Because these reserves are part of banks' portfolio of highly liquid assets, the regulations will potentially alter banks' demand for reserves, changing the relationship between market conditions and the resulting interest rate. Central banks will need to take these changes into account when deciding on monetary policy operations.

In this special feature, we study the interactions that may arise between liquidity regulation and monetary policy implementation. Our discussion is based on a standard economic model for analysing the process of implementing monetary

[1] We are grateful to Stephen Cecchetti and the New York Fed's Jamie McAndrews for stimulating discussions. We thank Claudio Borio, Wayne Byres, Christian Upper and Jingchun Zhang for useful comments and Jhuvesh Sobrun for excellent research assistance. The views expressed are those of the authors and do not necessarily reflect those of the BIS.

policy, which we extend to incorporate a liquidity requirement in the form of an LCR.

The key takeaway from our analysis is that, while the LCR will not impair central banks' ability to implement monetary policy, the process whereby this is done may need to adjust. Once the LCR is in place, central banks will need to consider not only how the size of an open market operation affects interest rates, but also how the structure of the operation affects bank balance sheets. In certain circumstances, central banks may choose to adjust their operational frameworks to better fit the new environment. At a minimum, they will need to monitor developments that materially affect the LCR of the banking system – just as they have traditionally monitored other factors that affect reserve markets.

We begin with a short primer on the LCR – including its definition and a brief discussion of how far the banking system currently is from meeting the regulatory threshold. We also touch on how both interbank and lending facility borrowings affect a bank's LCR. We then present a simple version of the textbook model of monetary policy implementation, followed by an extended version that includes an LCR requirement. Finally, we discuss how different types of open market operations affect bank balance sheets and the LCR calculations before offering some concluding remarks.

A primer on the liquidity coverage ratio[2]

As stated by the Group of Central Bank Governors and Heads of Supervision, "[t]he aim of the Liquidity Coverage Ratio is to ensure that banks, in normal times, have a sound funding structure and hold sufficient liquid assets such that central banks are asked to perform as lenders of last resort and not as lenders of first resort."[3]

The LCR builds on traditional liquidity "coverage" methodologies used internally by banks to assess exposure to stress events. The LCR requires that a bank's stock of unencumbered high-quality liquid assets (HQLA) be larger than the projected net cash outflows (NCOF) over a 30-day horizon under a stress scenario specified by supervisors:

$$LCR = \frac{\text{Stock of unencumbered high-quality liquid assets}}{\text{Total net cash outflows over a 30-day stress scenario}} = \frac{HQLA}{NCOF} \geq 100\% \qquad (1)$$

High-quality liquid assets include central bank reserves, debt securities issued (or guaranteed) by public authorities, and highly rated non-financial corporate bonds and covered bonds. Total expected cash outflows are calculated by multiplying the size of various types of liabilities and off-balance sheet commitments by the rates at which they are expected to run off or be drawn down in the stress scenario. For example, unsecured interbank loans are assumed to run off completely if they come

[2] The description of the LCR is based on BCBS (2010).

[3] The Group of Central Bank Governors and Heads of Supervision oversees the work of the Basel Committee on Banking Supervision. Quoted from the press release of 8 January 2012, available at www.bis.org/press/p120108.htm.

Box 1: Computing the LCR

Two types (or "levels") of assets can be applied towards the HQLA pool in the numerator of a bank's liquidity coverage ratio. Level 1 assets include cash, central bank reserves and debt securities issued or guaranteed by public authorities with a 0% capital risk weight under Basel III. Level 2 assets include debt securities issued by public authorities with a 20% risk weight plus highly rated non-financial corporate bonds and covered bonds. Moreover, Level 2 assets may comprise no more than 40% of a bank's total stock of HQLA. In other words, the quantity of Level 2 assets included in the HQLA calculation can be at most two thirds of the quantity of Level 1 assets. In addition, Level 2 assets are subject to a 15% haircut when added to HQLA. All assets included in the calculation must be unencumbered (eg not pledged as collateral) and operational (eg not used as a hedge on trading positions). A bank's stock of high-quality liquid assets can then be written as:

$$HQLA = Level1 + \min(85\% \times Level2, \tfrac{2}{3} \times Level1)$$

The stress scenario used for computation of net cash outflows envisions a partial loss of retail deposits, significant loss of unsecured and secured wholesale funding, contractual outflows from derivative positions associated with a three-notch rating downgrade, and substantial calls on off-balance sheet exposures. The calibration of scenario run-off rates reflects a combination of the experience during the recent financial crisis, internal stress scenarios of banks, and existing regulatory and supervisory standards. From these outflows, banks are permitted to subtract projected inflows for 30 calendar days into the future. However, the fraction of outflows that can be offset this way is capped at 75%. The expected net cash outflows are, therefore, given by:

$$NCOF = outflows - \min(inflows,\ 75\% \times outflows)$$

To better understand these formulas, it is helpful to compute the LCR for a very simple bank. Consider a bank that holds four types of assets: reserves, treasury securities, corporate bonds and commercial loans. Reserves and treasuries are Level 1 assets, and suppose the corporate bonds are Level 2 assets. The bank funds itself using a combination of deposits, overnight interbank borrowing, borrowings from the central bank and equity. Table A lists the values of the relevant balance sheet items. The stock of high-quality liquid assets for LCR purposes is:

$$HQLA = R + T + \min(85\% \times B, \tfrac{2}{3} \times (R + T)) = 75 + \min(85, 50) = 125$$

The outflow of funds associated with the stress scenario depends on the run-off rates specified in the LCR rules for the different types of liabilities. Using θ_i to denote the run-off rate for liabilities of type i and letting O = 10 denote contractual outflows, we have:

$$Outflows = \theta_D D + \theta_\Delta \Delta + \theta_X X + O = 10\% \times 460 + 100\% \times 80 + 25\% \times 0 + 10 = 136$$

where the run-off rate for deposits is taken to be 10%, the run-off rate on overnight interbank borrowing is 100%, and the run-off for secured transactions with the central bank against non-HQLA is 25%. Assuming contractual inflows of 6, the expected net cash outflow is:

$$NCOF = 136 - \min(6,\ 75\% \times 136)\ =\ 136 - \min(6,\ 102)\ =\ 130$$

Hence, the LCR of the bank is given by:

$$LCR = 125 / 130 = 96\% < 100\%$$

As the LCR is below 100%, this bank would need to make changes to its balance sheet in order to comply with the new liquidity standards.

Table A

Assets		Liabilities	
Reserves (*R*)	25	Deposits (*D*)	460
Treasuries (*T*)	50	Interbank borrowing (Δ)	80
Corporate bonds (*B*)	100	Central bank borrowings (*X*)	0
Commercial loans (*L*)	42	Equity (*E*)	60
Total	600	Total	600

due during the stress scenario, whereas deposits are assumed to run off by 5 or 10%, depending on the characteristics of the deposit. The denominator of the LCR is on a "net" basis, as contractual inflows can be deducted from outflows, subject to a cap. Further details on how the LCR is computed are given in Box 1.

The impact of the new regulation will depend in part on how close banks are to the LCR threshold once the regulation is implemented.[4] If most banks satisfy the LCR requirement by a comfortable margin, the regulation's effect on their behaviour – and hence on the process of monetary policy implementation – will be fairly minor. If, however, many banks fall short of the new standards, the impact is more likely to be significant.

Insofar as meeting the LCR requirement is costly for banks, it is conceivable that some banks may not exceed the regulatory threshold by a considerable margin, which could allow the LCR to impact the implementation of monetary policy. However, before we can address this issue, we need to understand how interbank loans and borrowing from the central bank affect the calculation of the LCR.

Interbank loans, central bank borrowing and the LCR

Central bank reserves are included in the calculation of HQLA and, hence, acquiring reserves can potentially help alleviate an LCR shortfall.[5] However, it matters how a bank acquires the reserves, that is, what new liabilities are created in the process.[6] Suppose, for example, that a bank with an LCR below the threshold borrows funds in the overnight interbank market. Such borrowing raises both the numerator and the denominator of a bank's LCR by the same amount:

$$LCR_{new} = \frac{HQLA_0 + \textit{overnight interbank loan}}{NCOF_0 + 100\% \times \textit{overnight interbank loan}} \tag{2}$$

In other words, overnight interbank borrowing cannot help a bank reach the regulatory threshold. It can only bring it asymptotically close to 100%, as shown by the red line in the left-hand panel of Graph 1.

In contrast, interbank loans of more than 30 days, eg three months, are not included in NCOF, as the repayment falls outside the stress scenario:

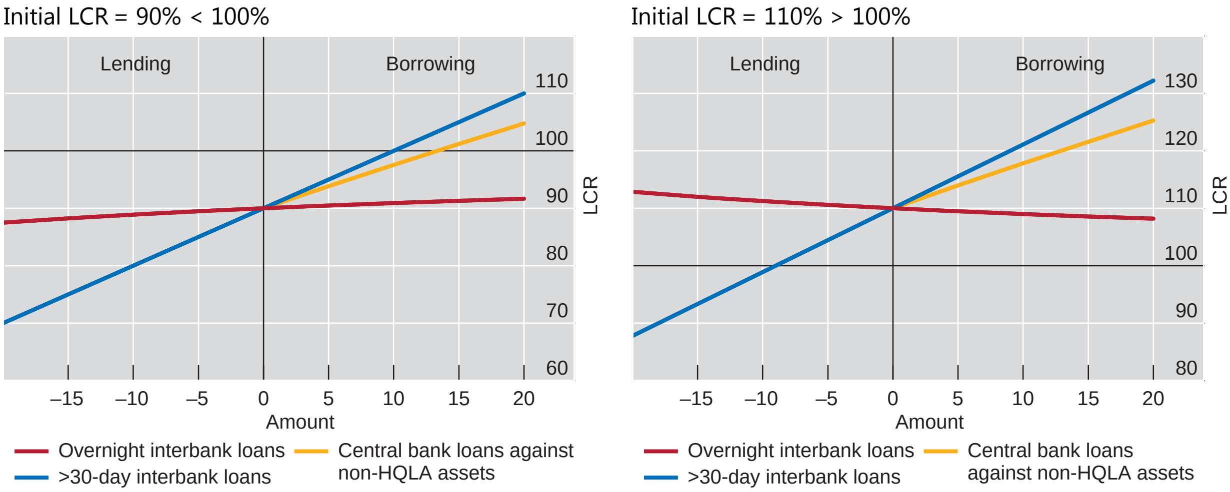
$$LCR_{new} = \frac{HQLA_0 + \textit{3-month interbank loan}}{NCOF_0} \tag{3}$$

4 The LCR establishes minimum levels of liquidity for internationally active banks. Consistent with the BCBS's capital adequacy standards, national authorities are free to require higher minimum levels of liquidity (BCBS (2010, paragraph 6)).

5 Central bank reserves held to meet reserve requirements may be included in HQLA, to the extent that these reserves can be drawn down in times of stress. The LCR rules text states that "[l]ocal supervisors should discuss and agree with the relevant central bank the extent to which central bank reserves should count towards the stock of liquid assets, ie the extent to which reserves are able to be drawn down in times of stress".

6 For simplicity, we assume that neither the caps on Level 2 assets nor inflows, discussed in Box 1, are binding.

LCR impact of interbank and central bank loans Graph 1



Source: Authors' calculations.

Borrowing longer-term increases the numerator of a bank's LCR without changing the denominator and thus *can* be used to make up a deficiency (blue line in the left-hand panel of Graph 1). For a bank facing a possible deficiency, therefore, loans with terms longer than 30 days are more valuable than loans with terms of 30 days or less. For this reason, the introduction of an LCR may increase the term premium at the very short end of the yield curve.

A bank facing a potential LCR deficiency can also borrow reserves from the central bank. For example, if the central bank's standing lending facility (or discount window) accepts non-HQLA assets as collateral, then the LCR rules specify a run-off rate of 25% (that is, a 75% rollover rate) for borrowing from this facility.

$$LCR_{new} = \frac{HQLA_0 + discount\ window\ loan}{NCOF_0 + 25\% \times discount\ window\ loan} \qquad (4)$$

In other words, borrowing from the central bank raises a bank's NCOF, but by *less* than the amount of the loan. A bank can, therefore, in principle make up an LCR deficiency by borrowing – at the penalty rate – a sufficient amount of funds from the central bank (yellow line in the left-hand panel of Graph 1).

Monetary policy implementation and the LCR[7]

Many central banks around the world have adopted a framework for monetary policy that involves targeting a value for the overnight interest rate on interbank loans of reserves. Changes in this overnight rate translate into changes in other interest rates in the economy and thereby influence the level of economic activity.

The exact manner in which central banks steer the market interest rate to their target level varies quite a bit in practice.[8] However, most central banks operate

[7] This section is based on Bech and Keister (2012).

some form of a "corridor" system. In such a system, the central bank offers a deposit facility that allows banks to deposit excess reserves and earn an interest rate r_D, which is typically lower than the target rate r_T. The central bank also offers a lending facility at which banks can borrow reserves, typically against collateral and at a "penalty" interest rate $r_P > r_T$. Together, the interest rates at these two facilities form a "corridor" within which the market rate will remain. Within this corridor, central banks aim to adjust the quantity of reserves in circulation in such a way that interbank lending takes place at or near the target rate

A standard model

In the canonical model of monetary policy implementation, which builds on Poole (1968), banks hold reserves primarily to satisfy regulatory reserve requirements.[9] A bank can alter the quantity of reserves it holds by borrowing or lending funds in the interbank market. However, each bank faces some uncertainty about the payment flows into and out of its account that will occur late in the day and, hence, about its end-of-day reserve position. This uncertainty implies that the bank cannot be sure of exactly satisfying its reserve requirement.[10]

In deciding how much to borrow or lend in the interbank market, a bank must balance two concerns. If it experiences a large enough net payment outflow, it will find itself short of reserves at the end of the day and will have to borrow from the central bank to meet its requirement. Such borrowing is costly because the central bank typically charges a premium above market rates at its lending facility and, in addition, there may be stigma associated with using this facility. If the net payment outflow is smaller, on the other hand, the bank will end up holding reserves in excess of its requirement. In this case, it suffers an opportunity cost because those reserves could have been lent out at the market interest rate, which is typically higher than what banks earn on deposits held at the central bank.

Graph 2 shows the relationship between the quantity of reserves and the equilibrium interest rate in the overnight market that comes out of this model. The horizontal axis measures the total quantity of reserves, denoted by R, and the point K represents total required reserves for all banks. The vertical axis measures the market interest rate on overnight loans between banks. To understand the shape of this curve, we ask the following question. Suppose there was a representative bank that held R units of reserves and faced a reserve requirement of K. How much would this bank be willing to pay to borrow an additional unit of reserves in the overnight market?

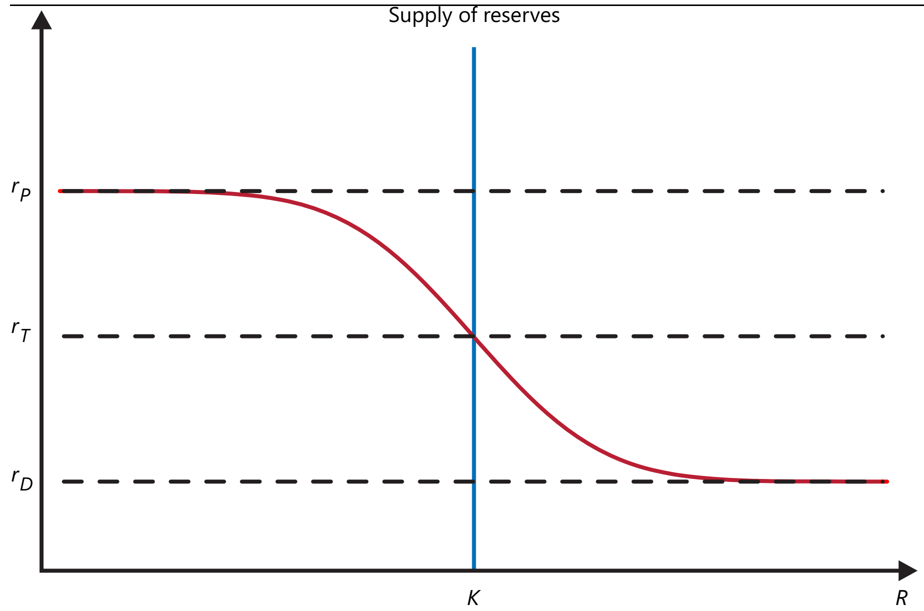
8 See eg Borio (1997) and Markets Committee (2009) for overviews of central bank operational frameworks.

9 See Bindseil (2004) for a detailed discussion of this framework. Ennis and Keister (2008) provide a short introduction and overview.

10 Many central banks allow banks to meet their reserve requirement on average over a reserve maintenance period, rather than applying the requirement each day. In addition, banks may be allowed to carry forward part of any shortfall to the next maintenance period. These approaches provide banks with more flexibility in managing their reserve holdings, but do not alter the basic conclusions of the model. For simplicity, we do not consider reserve averaging or carry-over provisions here.

Standard model of monetary policy implementation in corridor system

Graph 2



Source: Bech and Keister (2012)

If R is much smaller than K, the bank is certain to need to borrow from the lending facility to meet its requirement. In this situation, the bank would be willing to pay up to the cost of borrowing from the lending facility, r_P, for the additional unit of funds. If R is much larger than K, on the other hand, the bank is certain to meet its reserve requirement regardless of its late-day payment flows. In this case, the only value the bank receives from an additional unit of reserves is the interest it earns by depositing the funds with the central bank, r_D. Therefore, the bank would only be willing to pay r_D to borrow an additional unit of funds.

For intermediate values of R, whether the bank needs to borrow from the central bank or ends up holding excess reserves depends on its late-day payment flows. The rate a bank would be willing to pay to borrow an additional unit of reserves thus falls somewhere between r_P and r_D. Within this region, a larger value of R implies that the bank will be less likely to fall short of its requirement and, hence, would be willing to pay less for an additional unit of funds. In other words, the relationship between the quantity of reserves and the interest rate is downward-sloping: a larger supply of reserves lowers banks' marginal value of overnight funding. Note that, as shown in the graph, the interest rate in this simple model always remains in the corridor created by the rates r_D and r_P.

The total supply of reserves depends on the actions of the central bank as well as changes in factors outside its control, such as shifts in currency demand or flows into and out of the government account at the central bank. Given a target value for the interest rate in the overnight market r_T, the central bank uses open market operations to steer the supply of reserves to the appropriate level. The target interest rate is often the midpoint of the corridor, as depicted in Graph 2. In this simple model, the appropriate supply of reserves is then equal to total required reserves. In reality, central banks tend to supply small amounts of excess reserves in order to achieve the target interest rate.

A model with the LCR

This simple framework can help us think about how the introduction of the LCR may affect the process of implementing monetary policy. Bech and Keister (2012) study an extended model in which banks can borrow and lend in both overnight and term markets. To keep the analysis simple, the term market is assumed to have a maturity greater than 31 days. Moreover, all items on banks' balance sheets are taken as given, with the exception of reserves and interbank lending.[11] The paper examines how the equilibrium interest rates in the two interbank markets – overnight and term – are affected by the introduction of an LCR requirement.

A key insight is that reserves borrowed from the central bank lending facility can perform a double duty: they serve as HQLA for LCR purposes, and at the same time can be applied towards the bank's reserve requirement. This fact creates a direct linkage between the LCR and monetary policy implementation in the model.[12] A bank that anticipates borrowing from the central bank lending facility for LCR purposes will tend to have a lower demand for funds in the overnight interbank market. In this way, the introduction of an LCR could change the relationship between the quantity of reserves and the overnight interest rate depicted in Graph 2.

When bank balance sheets are such that the LCR requirement is met comfortably even when reserves are excluded from the calculation of HQLA, the process of monetary policy implementation is unaffected. In this case, banks' demand for reserves is once again based primarily on the need to meet their reserve requirements, and the overnight interest rate is determined by the supply of reserves exactly as in Graph 2. In this simple setting, there is no term premium; the term rate is equal to the overnight rate.

Suppose, however, that banks rely, in part, on their reserve holdings to satisfy the LCR. Then, a late-day payment outflow may leave the bank with a deficiency in its LCR requirement, its reserve requirement, or both. The behaviour of equilibrium interest rates in this case can be quite different, as illustrated in the two panels in Graph 3. To understand the shapes of these curves, it is useful to again imagine a representative bank that holds R units of reserves and faces a reserve requirement of K. How much would this bank be willing to pay to borrow an additional unit of reserves in each of the two interbank markets?

In both of the cases shown in Graph 3, the bank is nearly certain of meeting its LCR requirement when R is large enough. In this situation, the bank's willingness to pay for funds is determined by concerns related to the reserve requirement and is the same as in the standard model with no LCR. In particular, the interest rates on overnight loans (red) and term loans (green) are equal in this case because both types of borrowing are equally effective in meeting the reserve requirement.

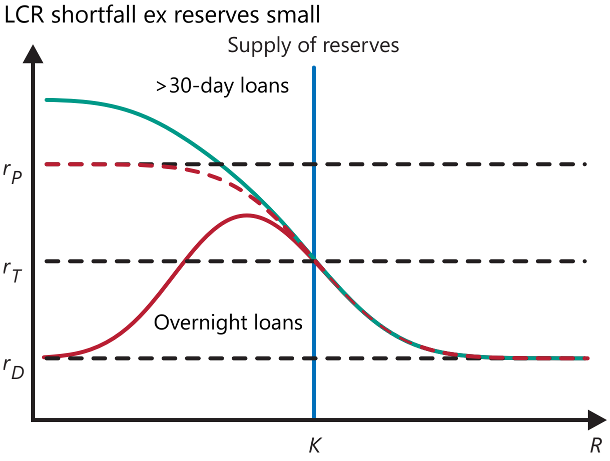
For lower values of R, however, the bank begins to take into account the possibility that it will need to borrow from the central bank to correct an LCR deficiency. In this region, a sizeable term premium emerges: term loans are more

[11] This assumption is also implicitly made in the standard model. To the extent that banks are able to make other balance sheet adjustments within the day, these actions could potentially mitigate some of the effects we highlight here.

[12] As with reserve requirements, we assume that banks are obliged to meet the LCR every day and that the explicit or implicit cost of breaching the requirement is higher than the cost of borrowing from the central bank lending facility.

Model of monetary policy implementation in corridor system with LCR

Graph 3



Source: Bech and Keister (2012).

valuable because they help correct an LCR deficiency while overnight loans do not. Moreover, the overnight interest rate actually *falls* as the supply of reserves *R* decreases past a certain point. As the bank becomes increasingly likely to borrow from the central bank to correct an LCR deficiency, it recognises that the reserves it borrows will perform a double duty. That is, the reserves obtained from the central bank lending facility at the end of the day can be applied towards the reserve requirement as well. As a result, it becomes increasingly likely that the bank will end up holding reserves in excess of the reserve requirement, and its marginal value of overnight funding decreases as shown in the graph.

In the situation depicted in the left-hand panel of Graph 3, the central bank can follow the standard procedure for implementing monetary policy. If it supplies a quantity of reserves approximately equal to total required reserves, the overnight interest rate will fall in the middle of the corridor and the term premium will be negligible. In the situation depicted in the right-hand panel, however, the results will be different, as banks find themselves in the region where a term premium emerges and the presence of the LCR lowers the value of an overnight loan. In fact, in this case, there is no level of reserve supply that will yield an overnight rate equal to the target rate at the midpoint of the corridor.

This analysis suggests that, in some situations, central banks may need to adjust their operational frameworks once the LCR is in place. Several types of adjustments could be considered, such as making the corridor asymmetric or targeting a term interest rate.[13] Moreover, the operations desks of central banks should keep a watchful eye on developments affecting the LCR of the banking system, in much the same way that they have traditionally focused on other factors affecting the demand for and supply of reserves. In fact, the open market operations that central banks conduct will themselves affect the LCR of the banking system. That is, the act of adjusting the supply of reserves may shift the demand curve for the reserves. We turn to this issue next.

[13] The "floor system" of monetary policy implementation, as discussed in Goodfriend (2002) and Keister et al (2008), for example, can be viewed as a type of asymmetric corridor. The Swiss National Bank currently targets a three-month interest rate rather than an overnight rate.

The LCR and open market operations

Open market operations (OMOs) are monetary policy operations in which the central bank exchanges reserves for assets with the private sector.[14] These operations can be structured in a variety of different ways: as outright purchases (or sales) of assets or as reverse operations, with differing categories of assets eligible for purchase or for use as collateral, and with different types of counterparties.[15] In the standard model of monetary policy implementation, only the size of an operation matters for determining its effect on the overnight interest rate; the other details do not. In other words, adding or subtracting a unit of reserves has the same effect on market interest rates regardless of how the operation is structured.

Once the LCR is introduced, this property no longer holds. The structure of an OMO determines how it affects elements of bank balance sheets other than reserves and, therefore, can directly affect banks' liquidity ratios. A couple of simple examples are helpful to illustrate this point. First, if the central bank buys government bonds from a bank, the bank's LCR is unchanged, as one type of high-quality liquid (Level 1) asset replaces an equal quantity of another:

$$LCR_{new} = \frac{HQLA_0 + \Delta reserves \text{ - } \Delta goverment\ bonds}{NCOF_0} = \frac{HQLA_0}{NCOF_0} = LCR_0 \quad (5)$$

In contrast, if the central bank buys non-HQLA assets from the bank, then the LCR of the bank increases, as non-HQLA is swapped for HQLA assets:

$$LCR_{new} = \frac{HQLA_0 + \Delta reserves}{NCOF_0} > LCR_0 \quad (6)$$

The LCR also increases if the central bank buys assets from a customer of the bank. The proceeds are credited to the bank as reserves, and the non-bank customer receives a claim on the bank in the form of deposits. The increase in deposits raises the bank's NCOF, but by much less than the size of the purchase because the run-off rate for deposits is only 5 or 10%:

$$LCR_{new} = \frac{HQLA_0 + \Delta reserves}{NCOF_0 + 10\% \times \Delta deposits} > LCR_0 \quad (7)$$

Many of the unconventional monetary policies employed by central banks in the aftermath of the financial crisis are forms of open market operations. Box 2 looks at the hypothetical impact of the Federal Reserve's Large-Scale Asset Purchases had the new liquidity regulation already been in place.

[14] Originally, the expression referred to operations in the open market (ie secondary or interbank market) where the central bank acted as a normal, possibly anonymous, participant – for instance, by buying or selling treasury securities (Bindseil (2004)). Later, the expression began to also cover so-called reverse operations, where the central bank undoes the initial operation at a later stage.

[15] For example, the Federal Reserve distinguishes between temporary and permanent OMOs. Temporary OMOs involve repurchase and reverse repurchase agreements that are designed to temporarily add to or subtract from the total supply of reserves in the banking system. Permanent OMOs involve the buying and selling of securities outright to permanently add or subtract reserves. The ECB, in contrast, relies to a large extent on revolving reserve operations of various maturities.

Box 2: Unconventional monetary policies and the LCR

In the aftermath of the financial crisis, several central banks have engaged in substantial open market operations, eg Large-Scale Asset Purchases (LSAP) or quantitative easing (QE), with a view to providing additional monetary stimulus to support the economic recovery.

An interesting thought experiment is to determine how such operations may have impacted the LCR had it already been in place. Unfortunately, while historical data are available on bank assets and liabilities, this is not the case for other data such as contractual in- and outflows and asset encumbrance. Hence, we focus instead on the narrower question of the impact on the stock of HQLA under the assumption that all assets are unencumbered and operational (see Box 1).

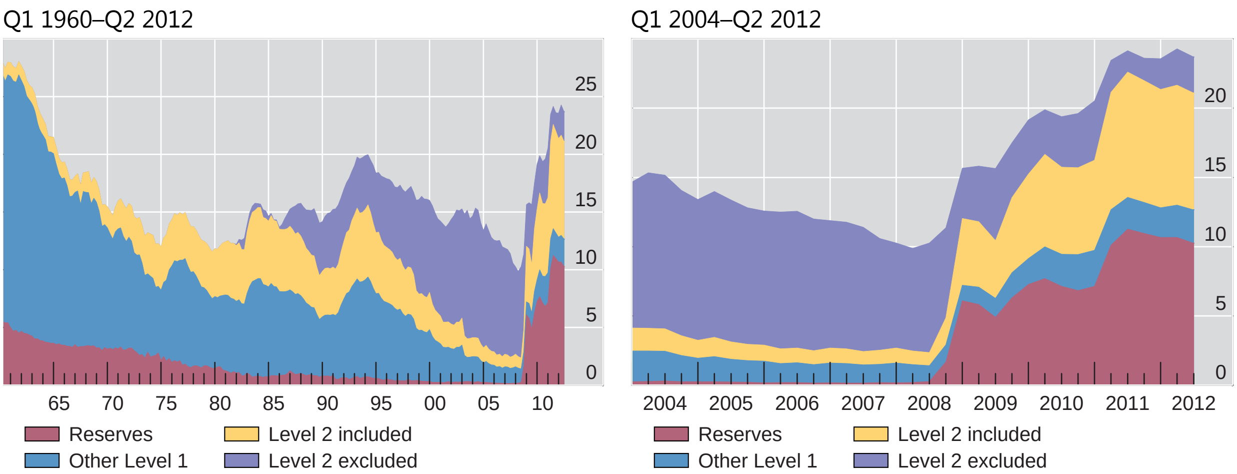
Using historical balance sheet data for all private depository institutions in the United States, Graph A shows the stock of "potential" HQLA since 1960.[①] The red area refers to the individual contributions from reserves; the blue area to other Level 1 assets; and the yellow area to Level 2 assets included, that is, the amount of these assets below the 40% cap. The purple area shows the amount of Level 2 assets excluded due to the cap. Everything is measured as a percentage of total assets.

The graph shows that the amount of Level 1 and Level 2 assets held by US depository institutions fell from over 25% of assets in 1960 to just over 10% in the runup to the financial crisis. Part of the downward trend in the stock of potential HQLA (the sum of the red, blue and yellow areas) is explained by a move towards holding more Level 2 assets, primarily in the form of agency debentures and mortgage-backed securities. The graph also shows that the interventions by the Federal Reserve have reversed much of the fall in potential HQLA over the previous four decades, with potential HQLA growing to just under 20% of total assets in mid-2012. The rise is driven in part by the increase in reserves, which had the effect of raising both Level 1 assets and the cap on Level 2 assets that can count as HQLA. In addition, banks are likely to have decided to hold a larger stock of liquid assets.

① Information from the Federal Financial Institutions Examination Council (Call Reports) suggests that roughly one third of securities currently held by US depository institutions are in fact encumbered. Unfortunately, granular and historical information was not readily available for this analysis.

Hypothetical HQLA for private depository institutions in the United States[1]

As a percentage of total assets | Graph A



[1] All assets are assumed to be operational and unencumbered.

Source: Federal Reserve Statistical Release, Z.1 (flow of funds, Table L.109).

Conclusions

The introduction of the liquidity coverage ratio will influence banks' liquidity management procedures and, hence, their demand for funds in the interbank market. Central banks that conduct monetary policy by setting a target for the interest rate in this market will, therefore, need to take this change into account. In this feature, we analyse how the introduction of an LCR affects the process of monetary policy implementation in the context of a simple, well known model of banks' reserve management.

This analysis points to three basic conclusions. First, the LCR will not impair the ability of central banks to implement monetary policy, but the process by which they do so may change. Second, correctly anticipating an open market operation's effect on interest rates will require central banks to consider not only the size of the operation, but also the way the operation is structured and how it impacts on bank balance sheets. Finally, the LCR may increase the steepness of the very short end of the yield curve by introducing an additional premium for interbank loans that extend beyond 30 days.

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