

Benoît Cœuré: Liquidity regulation and monetary policy implementation – from theory to practice

Speech by Mr Benoît Cœuré, Member of the Executive Board of the European Central Bank, at the Toulouse School of Economics, Toulouse, 3 October 2013.

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Ladies and Gentlemen,

It is a great pleasure for me to speak at the Toulouse School of Economics.

In my remarks today, I would like to discuss the recent developments on liquidity regulation and the interplay between the new liquidity requirements and monetary policy implementation.

The recent financial crisis provided a vivid illustration of how liquidity risk that materialises in some segments of the financial system can lead to the drying-up of liquidity in entire market segments, such as unsecured interbank markets, causing a system-wide scramble for liquidity. In that context, central banks have played a role of intermediary for interbank transactions and prevented our bank based financial system from collapsing.

At the beginning of my remarks, I will talk about the rationale for liquidity regulation and I will provide an overview of the new set of liquidity requirements that the Basel Committee on Banking Supervision has proposed to complement its revised capital requirements framework.

These recent developments give rise to two issues that I would like to address today. First, how do liquidity regulation and monetary policy implementation interact? I will argue that the new set of liquidity requirements is expected to have an impact on how monetary policy is implemented in normal times. It is important to understand how this new requirement may impact the current operational framework, especially for the Eurosystem, and the functioning of money markets.

The second issue regards lending of last resort. It is commonly accepted that central banks have to act as lenders of last resort (LOLR) towards banks during a crisis period, when liquidity can dry up. But it is also well known that such intervention can generate moral hazard in the banking system, lead central banks to take unwarranted credit risk and, in some extreme cases, interfere with their primary mandate – price stability.

Are the new liquidity ratios, in combination with the revised capital ratios, sufficient to prevent the central bank from becoming the lender of *first* resort? Based on recent academic research, to which researchers of this university have significantly contributed, I will argue that liquidity regulation can ensure that central bank intervention remains exceptional, and be designed in a way that is compatible with sound incentives in the banking system.

Rationale for liquidity regulation

I would like to begin by briefly highlighting the micro- and macro-prudential benefits that will derive from a new set of liquidity standards. In particular, they should lead to an increase in individual credit institutions' liquidity buffers, and reduce the risks posed by maturity transformation.

The recent financial crisis provided a dramatic illustration of how liquidity risk materialises. The inadequacies of banks' liquidity management became apparent when some markets for long-term debt securities (including ABS, ABS CDOs, etc.) experienced a sudden re-pricing, resulting from the fact that risks were not properly reflected in their prices. Banks faced

substantial liquidity outflows and shortages owing to their excessive exposure to these instruments and their excessive reliance on short-term and volatile secured market funding sources. In the US, this phenomenon mainly materialised as a “run on repo”;¹ in the euro area, it resulted into drying up of foreign currency funding, severe strains in bank unsecured funding, and/or a reduced access to repo through clearing houses. In all cases, the central bank had to step in and to expand its liquidity provision to banks.

What does this imply for liquidity regulation? Regulations should start from first principles, and we therefore have to identify the market failures or negative externalities that liquidity regulation aims at addressing.

I consider that there are three main objectives for liquidity regulation: a) to reduce the impact of uncertainty on the bank risk profile, b) to build up liquidity buffers and c) to mitigate the systemic characteristics of a liquidity crisis.

Maturity transformation gives rise to liquidity risk since, by definition, a bank engaging in maturity transformation cannot honour sudden and large withdrawal requests by depositors. They may face similar difficulties if interbank market lenders refuse to roll over their loans. Such coordination failure may arise not because the depositors or the interbank market participants think the bank is likely to be insolvent, but because they anticipate others will withdraw.² The rationale of liquidity requirements is that they reduce the impact of uncertainty on the bank risk profile, since they allow the bank to withstand larger withdrawals. LOLR and deposit insurance are other ways to achieve the same means: mitigating the risk of a run. The difference is that liquidity requirements are internalised, while LOLR and deposit insurance are externalised to the central bank and to the taxpayers, respectively. Another difference is that liquidity requirements and deposit insurance exert their effects *ex ante* while LOLR happens after the fact.

An additional micro-prudential benefit derived from liquidity requirements relates to a special role of liquid assets. By maintaining liquidity buffers in advance, banks commit to removing solvency risk from a portion of their portfolio. This limits solvency risk and encourages good risk management, acting as a prudential regulatory tool alongside other requirements, such as capital buffers or bail-inable debt, that also exert discipline on bank risk-taking behaviour.³ A counterargument is however that holding a large balance of liquid assets gives bank management too much discretion and can thus create agency problems.⁴

Liquidity standards should also be designed to mitigate adverse effects owing to inherently systemic characteristics of a liquidity crisis. The reaction of one bank to liquidity strains might create major liquidity strains for other banks. This may indeed require liquidation of long-term and illiquid assets, imposing externalities on other banks through a fire sales spiral and various forms of financial contagion. In addition, the failure of a bank that occupies a critical size or position in a market could have immediate systemic implications: some segments of financial markets might just cease to operate, and its disorderly collapse would lead to

¹ Gorton and Metrick (2012) document a full-scale “run” on repo; see G. Gorton and A. Metrick, “Securitised banking and the run on repo”, *Journal of Financial Economics*, forthcoming. However, Krishnamurthy et al. (2012) document that a “run” on repo didn’t seem to have occurred in some repo segments; see A. Krishnamurthy, S. Nagel and D. Orlov, “Sizing up repo”, NBER Working Paper No. 17768, 2012.

² As in D. Diamond and P. Dybvig, “Bank runs, deposit insurance, and liquidity”, *Journal of Political Economy* 91, 1983.

³ Calomiris, Heider, and Hoerova (2013) highlight the potential benefits of bank liquidity requirements in comparison with capital; see. C. Calomiris, F. Heider and M. Hoerova, “A theory of bank liquidity requirements”, mimeo, European Central Bank, 2013.

⁴ See S. Myers and R. Rajan (1998), “The paradox of liquidity”, *Quarterly Journal of Economics*, Vol. 113, pp. 733–771.

considerable losses for other financial institutions, including the central bank itself.⁵ In this environment, a bank's private choice of liquidity buffers will not reflect what is socially optimal.⁶

In the presence of such externalities, there is indeed a need for explicit regulation. This leaves the choice open between regulating liquidity through prices (i.e. through interest rates) and through quantities (i.e. liquidity buffers), hence the intimate interaction between monetary policy and prudential regulation of liquidity.⁷

Similarly, an expectation of public sector intervention and support for banks in crisis can create moral hazard and distort the incentives faced by financial institutions.⁸ As a consequence, the liquidity buffers chosen by banks could be insufficient. Such considerations call again for regulators to set and enforce prudential rules, and for central banks to act in a way that jointly is socially optimal.

The new liquidity regulation: Basel III liquidity standards

Let me now discuss in some detail the Basel III liquidity standards agreed upon in December 2010. The international community, through the Basel Committee on Banking Supervision (BCBS), drew up a proposal for liquidity risk regulation. The proposal includes two ratios, the Liquidity Coverage Ratio (LCR) and the Net Stable Funding Ratio (NSFR).

Under the LCR, banks are required to hold a minimum level of unencumbered high-quality liquid assets (HQLA), the numerator of LCR, to withstand total net cash outflows over an acute stress scenario lasting 30 days, the denominator of LCR. The LCR is specifically designed to improve the short-term resilience of banks against liquidity shocks.

By contrast, the NSFR measures the amount of longer-term stable sources of funding employed by an institution, the numerator of NSFR, relative to the liquidity profiles of the assets funded and the potential for contingent calls on funding liquidity arising from off-balance sheet commitments and obligations, the denominator of NSFR. Thus, the NSFR requires banks to fund illiquid assets with a minimum amount of stable liabilities over a horizon of one year.

Although the objectives of the LCR and NSFR are mainly microprudential in nature, some of their characteristics also have macroprudential foundations, and therefore should have systemic benefits. Still, they may have unintended consequences. In particular, I would like to reflect on how they may interact with central bank operations.

⁵ See, for example, V. Acharya and S. Viswanathan, "Leverage, moral hazard, and liquidity", *Journal of Finance* 66, 2011; F. Allen and D. Gale. "Financial contagion", *Journal of Political Economy* 108, 2000; M. Brunnermeier and L. H. Pedersen, "Market liquidity and funding liquidity", *Review of Financial Studies* 22, 2009; and R. Cifuentes, G. Ferrucci and H. S. Shin (2005), "Liquidity risk and contagion", *Journal of the European Economic Association* 3, 2005.

⁶ See, for example, E. Perotti and J. Suarez, "A Pigovian approach to liquidity regulation", *International Journal of Central Banking* 7, 2011.

⁷ Stein (2013) discusses liquidity regulation through price vs. quantities as a problem of social choice à la Ronald Coase, drawing on the classical analysis by Weitzman (1974). Along these lines, if HQLA-eligible assets are scarce, then the HQLA premium is likely to be both high and volatile and a price-based mechanism can be more relevant than regulating quantities through the LCR. See J. Stein (2013), "Liquidity Regulation and Central Banking", speech at the "Finding the Right Balance" 2013 Credit Markets Symposium sponsored by the Federal Reserve Bank of Richmond, Charlotte, North Carolina, April 19, and M. Weitzman (1974), "Prices vs. Quantities", *Review of Economic Studies*, vol. 41 (October), pp. 477–91.

⁸ Recent papers considering effects of government bail-outs on banks' maturity mismatch and financial stability include E. Farhi and J. Tirole, "Collective moral hazard, maturity mismatch, and systemic bailouts", *American Economic Review* 102, 2012, and T. Keister, "Bailouts and Financial Fragility", *Federal Reserve Bank of New York Staff Report No. 473*, 2010.

Liquidity regulation and monetary policy implementation

Incentives on the asset side of banks' balance sheet

How will liquidity regulations and monetary policy implementation interact in normal times? In my view, the interaction is expected to be complex and liquidity regulation may require adjustments to central banks' operational frameworks.

Although the central bank collateral framework received more limited attention in the recent academic literature than collateral used in private transactions,⁹ it is one of the most complex and economically significant elements of monetary policy implementation. The interaction between the collateral framework and liquidity regulation is of great importance, especially for the Eurosystem.¹⁰

Let me illustrate this. A possible strategy for euro area banks to meet their LCR requirements is to increase their reliance on central bank funding using non-HQLA collateral. This is due to two features of the LCR calibration, which are of particular relevance for the ECB.

First, the LCR and the Eurosystem's monetary policy framework differ as regards the definition of qualifying assets. The stock of HQLA accepted in the LCR is narrower than the stock of assets which are eligible as collateral for the Eurosystem's monetary policy credit operations. For example, asset backed securities (ABS) and uncovered bank bonds are accepted as Eurosystem collateral, but do not qualify generally as HQLA in the LCR. In addition, the LCR and the Eurosystem's collateral framework differ as regards haircuts that are applied to specific categories of assets.¹¹ Thus, there is no alignment between the definition and the risk assessment of liquid assets and the central bank's collateral framework. This is justified by the different purposes of liquidity regulation and of the central bank's collateral framework: the collateral framework protects the balance sheet of the central bank and, without prejudice to this objective, can support monetary policy transmission to the economy, which calls for a broader range of eligible assets, especially in such a diverse region as the euro area. This is also justified by the global nature of the LCR while central banks frameworks are all different.

Second, unlike interbank funding, central bank refinancing over a 30-day horizon would not count as an outflow in the denominator of LCR, as it always benefits from a 100% rollover rate. As a result of these two features taken together, this could increase demand for central bank refinancing. Banks could exploit regulatory arbitrage opportunities by posting non-HQLA as collateral, which would lead to an increase in the LCR.¹² While this also

⁹ An exception is Hilberg and Hollmayr (2011). They extend a New-Keynesian model introducing an interbank market and allowing the central banks to alleviate the liquidity shortage on the interbank market varying haircuts on eligible assets; see B. Hilberg and J. Hollmayr (2011), "Asset prices, collateral and unconventional monetary policy in a DSGE model", European Central Bank working paper series, No 1373. For a discussion on collateral used in private transactions see G. Gorton and A. Metrick (op. cit.) and J. Geanakoplos (2010), "The Leverage Cycle" in D. Acemoglu, K. Rogoff and M. Woodford, eds., NBER Macroeconomic Annual 2009, vol. 24, pp. 1–65, University of Chicago Press.

¹⁰ Bindseil (2013) discusses how the collateral framework can interact with liquidity regulation; see U. Bindseil (2013) "Central bank collateral, asset fire sales, regulation, and liquidity", mimeo, European Central Bank. For a description of the Eurosystem collateral framework, see the ECB website, <http://www.ecb.europa.eu/paym/coll/html/index.en.html>.

¹¹ Specifically, Level 1 assets are entirely taken into account in the LCR (no haircut) and thus benefit from a more beneficial treatment in the LCR than in the Eurosystem's collateral framework, while level 2 assets generally enjoy lower haircuts in the Eurosystem's collateral framework than in the LCR. These differences certainly reflect the different objectives of the LCR and the Eurosystem's collateral framework.

¹² Central bank refinancing always benefit from a 100% rollover rate no matter the quality of the assets used in the transaction. A 100% rollover rate ensures equal treatment between central banks implementing monetary policy through repo operations and central banks implementing monetary policy through outright purchases of

depends on the opportunity cost of obtaining liquidity from the Eurosystem, there may be a number of LCR-constrained banks with large amounts of non-HQLA collateral that is eligible for monetary policy operations.

Imagine a post-crisis monetary policy framework where the liquidity provision by the central bank would again be rationed and implemented through competitive auctions (instead of today's fixed rate, full allotment). If some banks have no access to market repos using their assets as collateral (owing to concerns in the market place about country, counterparty or collateral risk), it will be likely that these counterparties will bid in the liquidity-providing monetary policy tender operations using this collateral in order to obtain cash to cover both their funding needs and their LCR. All in all, one may therefore expect a general increase in bid amounts and bid rates in tender operations, as well as adverse selection in the participation to these operations.

Would this imply a changed risk profile of the Eurosystem's balance sheet? In principle no, as the central bank is protected by its risk management framework, including a haircut schedule calibrated to the credit and liquidity risk of pledged securities. But higher average haircuts could imply a higher level of asset encumbrance on the balance sheets of banks, with potential feedback loops onto the perception of credit risk at counterparty or even at country level.

Let me give a second example of how the interaction between liquidity regulation and monetary policy implementation might be expected to be complex, especially for the Eurosystem. On one side, the regulation aims at reducing banks' undue reliance on central bank liquidity, which is an intended consequence of the regulation. On the other side, the regulation might lead to a situation in which some euro area banks, presumably the most fragile, would rely more on the Eurosystem than otherwise. The central bank then risks becoming a "lender of first resort".

Still, on this note, let me recall that the Eurosystem implements monetary policy in normal times in an environment of a large and structural liquidity deficit by using temporary liquidity-providing operations in the form of reverse repos. This implies that some reliance on central bank funding is not undesirable, but rather wanted. The question is: how much is too much, to the point where it would allow banks to sustain flawed business models?

Work is being carried out further on the interaction between the LCR and central bank facilities so as to ensure that the LCR responds appropriately to the provision and withdrawal of liquidity support by central banks. In this context, it has been proposed that central banks provide a "Committed Liquidity Facility" (CLF) to banks faced with a scarcity of HQLA. Under a CLF, the *capacity* to borrow from the central bank counts towards HQLA, with banks paying an upfront fee for a determined amount of CLF commitment.

The CLF can potentially be useful not only in jurisdictions with a structural scarcity of HQLA, like for example Australia. The argument put forward is that banks in crisis times, wary of stigma effects, would not let their LCR ratio fall below 100 percent. A CLF, however, would allow banks to meet the LCR ratio at all times, although with time-varying reliance on private-market HQLA and on the CLF. One possibility would be for the central bank to encourage the drawdown of private-market HQLA by reducing the pricing of the CLF during crisis time.

I would agree with Jeremy Stein¹³ that a CLF with an upfront fee is very different from counting central-bank eligible collateral as HQLA at no cost, which could weaken the incentive to borrow in markets and create excessive reliance on central bank funding. The

assets. However, it increases the difference in treatment between repo transactions with central banks and interbank repo transactions not backed by level 1 HQLA.

¹³ See Stein (2013, op. cit.).

pricing of the CLF should therefore strike the right balance to protect monetary policy without undermining the effectiveness of the LCR as a prudential instrument.

On the one hand, in order to reduce pressure on demand for central bank funding, it is necessary that banks find it more attractive to pay the CLF commitment fee rather than to obtain central bank liquidity and leave it on their accounts at the central bank. A CLF that would only be used in stressed times would not serve our purpose. On the other hand, there is a danger perceived by some that a CLF could materially change the effectiveness of the LCR, as the definition of HQLA would *de facto* be substantially widened, which would offset the objective that banks should self-insure against liquidity risk. To avoid such an outcome, the following remedies exist: first, the pricing of the CLF in normal times should reflect the opportunity cost of a bank for holding HQLA rather than non-HQLA. As a result, reliance on the CLF should not be more attractive than holding private-market HQLA. Second, it has to be borne in mind that access to the CLF needs to be collateralised; hence collateral availability puts a “natural” limit to accessing HQLA in the form of a CLF.

Incentives on the liability side of banks’ balance sheet

Having discussed how a bank can operate on the asset side of its balance sheet to improve LCR compliance, I now turn to the liability side of its balance sheet.

A bank that faces the possibility of a LCR shortfall has the incentive to (i) decrease its reliance on short-term unsecured funding, (ii) decrease the 30 days net cash outflow, and (iii) to replace it by longer-term funding or, if this is too difficult or too expensive, by secured funding. Since outflow rates are zero for secured funding obtained from the central bank, but higher for secured funding obtained from other sources, the bank is more likely to borrow from the central bank by pledging non-HQLA assets, either in tender operations or in the marginal lending facility.¹⁴ As a result, this lessens the need of banks to seek funds in the short-term interbank market to ensure that the LCR requirement is met.¹⁵

A reduction in the reliance on short-term unsecured funding is an intended consequence of the LCR. However, the implementation of the LCR might then lead to an overall decline in unsecured money market activity, which could be problematic for the euro area.

Money markets play a central role for monetary policy transmission in the euro area. This is because the euro area financial system is largely bank-based, and interbank money market interest rates represent the marginal cost of funding bank loans. When money markets function normally, the ECB can influence the longer-maturity rates, which are relevant for determining bank lending rates, by steering very short-term money market rates close to its official rates. By the same token, a potential further decrease in depth of the unsecured money market, in particular at the short-term, would further impair the role of the money market in allocating and distributing liquidity in the euro area.

In addition, deep and liquid money markets play an important role in information aggregation and price discovery. Indeed, money market rates, such as Euribor and Libor, provide benchmark rates for the pricing of fixed-income securities and loan contracts throughout the economy. Moreover, unsecured money markets play a key role keeping in check banks’ risk-taking profile.¹⁶ The LCR may induce an additional term premium in the unsecured

¹⁴ If the bank has enough non-HQLA collateral, after haircuts, to satisfy its additional borrowing needs.

¹⁵ Bech and Keister (2013) extend a standard model of monetary policy implementation to include the new liquidity regulation and they discuss how different types of open market operations affect bank balance sheets and the LCR calculations; see M. Bech and T. Keister “The liquidity coverage ratio and monetary policy implementation”, BIS working papers, 2013.

¹⁶ Rochet and Tirole (1996) emphasise the role of interbank peer monitoring in reducing borrowers’ moral hazard and their excessive risk-taking ex post; see J.-C. Rochet and J. Tirole “Interbank lending and systemic risk”, *Journal of Money, Credit and Banking*, Vol. 28, No. 4, 1996. Hoerova and Monnet (2011) view market

money market (as demand might not be fully matched by supply) and segmentation in the market between maturities over and below 30 days. At the same time, by reducing liquidity risk, the LCR may lead to lower liquidity risk premia. The overall effect of these two countervailing forces is unclear though. While there could be an overall impact on the difference between short and longer-term rates, to assess the overall impact on the monetary policy transmission, one would need to see whether the transmission from short to longer-term rates would be also affected. However, it remains to be seen whether unsecured lending beyond 30 days will revive after the crisis.

As mentioned, this new set of liquidity requirements is expected to have important consequences for limiting solvency risk and encouraging good risk management. In fact, the regulation is expected to bring an overall positive effect on the functioning of the money market by internalising the negative externalities for financial stability and monetary policy, i.e. reducing information asymmetries concerning banks' liquidity risk exposure and their liquidity risk bearing capacity, creating the conditions for a better functioning of the money market.¹⁷

This has to be combined with actions ensuring a proper functioning of the money market (such as oversight of reference rates along the lines recently proposed by the European Commission). It should also be seen as a complement to regulatory reforms that will improve market discipline in other segments of the banks' liability structure, such as capital buffers and the new bail-in rules for senior bond-holders and uninsured depositors. And since bail-in rules have confirmed that insured depositors are protected by deposit guarantee schemes, meaning by the taxpayer, the banking supervisor is the public authority to whom insured depositors delegate the monitoring of bank behaviour – hence the need for strong banking supervision, free of national political influence.¹⁸

Liquidity regulation and lender of last resort

Finally, let me turn to the interplay between the ex ante regulation of liquidity ratios and the ex post provision of liquidity assistance in time of stress by the central banks.

Walter Bagehot famously advocated that a lender of last resort in a crisis should lend freely at a penalty rate to solvent but illiquid banks that have adequate collateral.¹⁹ Such intervention is seen as the primary method for mitigating the adverse systemic effects of a liquidity crisis, providing stability to the banking system and avoiding unfavourable consequences for the real sector.

Since the onset of the crisis, to prevent market-wide liquidity problems from turning into solvency problems for individual banks, the Eurosystem introduced, as of October 2008, a

discipline in the unsecured money markets as a provision of ex ante incentives to mitigate risk of borrowers' investments; see M. Hoerova and C. Monnet, "Money market discipline and central bank lending", presented at the workshop on the "Post-crisis design of the operational framework", mimeo, European Central Bank, 2011.

¹⁷ The effects of asymmetric information and counterparty credit risk on the interbank market functioning are analysed in F. Heider, M. Hoerova and C. Holthausen, "Liquidity hoarding and interbank market spreads: The role of counterparty risk", ECB Working Paper No. 1126, 2009.

¹⁸ See B. Cœuré (2013), "The implications of bail-in for bank activity and stability", opening speech at the conference on "Financing the recovery after the crisis – the roles of bank profitability, stability and regulation", Bocconi University, Milan, 30 September.

¹⁹ The LOLR should lend freely against good collateral, valued at pre-crisis levels, and at a penalty rate. These conditions are due to Bagehot (1873) and are also presented, for instance, in Humphrey (1975) and Freixas, Parigi and Rochet (2004); see W. Bagehot, "Lombard street", H.S. King, London, 1873; Humphrey, T. "The classical concept of the lender of last resort", *Economic Review*, 61, 2–9, 1975; and Freixas, X., Parigi B., and J.-C. Rochet "The lender of last resort: A 21st century approach", *Journal of the European Economic Association*, 2: 1085–1115, 2004.

fixed-rate, full allotment regime in its refinancing operations, offering unlimited liquidity to banks at a predictable cost against an expanded set of eligible collateral. The widening of collateral might be seen as a way to mitigate the adverse and destabilizing effects of short-term funding “runs” relating to a deterioration of asset liquidity, but it can also be seen as a way to *prevent* large recourse to central bank liquidity by banks, who would otherwise be subject to funding outflows at a later stage of the crisis. Such a widening has to be accompanied by proper risk management measures, such as haircuts, to mitigate the increase of the risk profile of the central bank. The challenge for the central bank is to “build-in” the possibility to expand the set of eligible collateral while mitigating the incentives for banks to abuse it.²⁰

Similarly, the LOLR’s function of providing emergency liquidity assistance has been criticised for provoking moral hazard by banks. Indeed, support that is considered as appropriate during the crisis might have perverse effects on the incentives of banks at a later stage. Banks may *ex ante* decide to take an excessive exposure to risk, knowing that the central bank will intervene if that risk materialises. Moreover, there is a fine line between liquidity and solvency needs, which in a crisis is often blurred. Central banks should therefore be particularly wary not to substitute for capital support that should be provided by shareholders, investors, or in last resort by governments. When such moral hazard problems are severe, the central bank might consider mitigating but not eliminating the externalities of a liquidity crisis – that is, not helping barely solvent banks and thus providing incentives for banks to conduct business in safe and sound manner.²¹ The challenge for the central bank is to find the appropriate balance between preserving financial stability and imposing discipline for the future.

While the new set of liquidity standards requires banks to hold sufficient liquid assets in good times to meet their outflows in a given stress scenario, it does not exclude the possibility that central bank liquidity support will be needed if events turn out even worse than that scenario. One solution could be to further increase the liquidity requirements. However, additional liquidity requirements aimed at mitigating systemic shocks could constitute a “waste” of liquidity, given that they would be used only under exceptional circumstances. On this note, the emergence of a “home bias” following the global financial crisis poses the risk of an additional “waste” of liquidity. The ring-fencing of capital and liquidity by local supervisors have constrained banks’ risk-taking outside domestic jurisdictions and banks’ ability to transfer and allocate liquidity across jurisdictions in which they operate. Lack of cooperation in the implementation of the new regulatory standards has a potential to lead to overprovision of self-insurance against solvency and liquidity risks, when capital could be invested for a more productive use.

Alternatively, a solution would consist in requiring banks to form pools of liquidity and to sign multilateral credit lines commitments, specifying the conditions under which an illiquid bank would be allowed to draw on its credit line. However, the risk of coordination failures is substantial and a purely private solution, by shifting inside liquidity around the system, does not address the aggregate liquidity need that arises in the case of systemic shocks.²² In such a situation, the public sector should intervene and provide outside liquidity *ex-post*.

²⁰ See Bindseil (2013, *op. cit.*).

²¹ Rochet and Vives (2001) provide a theoretical foundation for rescuing Bagehot’s view; see J.-C. Rochet and X. Vives “Coordination failures and the lender of last resort: Was Bagehot right after all?”, *Journal of the European Economic Association*, 2, 6, 1116–1147, 2004.

²² See B. Holmström and J. Tirole “Private and public supply of liquidity”, *Journal of Political Economy*, Vol. 106, No. 1, 1998. Tirole (2011) emphasises the role of macro-prudential policies to deal with shortages of aggregate liquidity; see J. Tirole “Illiquidity and all its friends”, *Journal of Economic Literature*, Vol. 49, No. 2, 2011.

Conclusion

Let me conclude.

In my remarks today, I have focused on new liquidity regulations and have argued that the interaction with monetary policy implementation is expected to be significant and complex. I would therefore conclude that liquidity regulation and central bank operations cannot be looked at in isolation.

The new set of liquidity requirements will provide for a better monitoring of risks on banks' balance sheets and will limit the social cost of liquidity crises. It has to be combined with actions ensuring a proper functioning of the money market, such as reform and oversight of reference rates. It should be seen as a complement to regulatory reforms that improve market discipline in other segments of the banks' liability structure, such as capital buffers and the new bail-in rules for senior bond-holders and uninsured depositors.

A more far-reaching question, which I did not address in this speech, is whether the increased risk-sensitivity of bank liabilities under the new regulatory regime will constrain the role of banks as providers of liquidity services to the economy, or as creators of "quasi-money". If so, this could put undue pressure on central banks as producers of the only truly safe and liquid asset – bank reserves. This makes it even more important for governments to be fiscally responsible so that Treasuries can keep or regain their role as safe and liquid instruments.

Going forward, central banks will continue to act as lenders of last resort, but the crisis has helped us better understand the conditions for it to be socially useful. One of these is an effective liquidity regulation that constrains the business models of banks in a way that ensures that liquidity risk is self-insured. If properly priced, instruments such as a Committed Liquidity Facility can complement liquidity regulation while protecting monetary policy.

Another condition is that the resort to central bank liquidity should be expensive, bounded in time, and addresses only emergency situations. This matters particularly in the euro area, where overreliance on central bank funding, including emergency liquidity assistance, can delay the necessary restructuring and changes in banks' business models.

And finally, there should remain a strict separation between capital and liquidity assistance that reflects the division of tasks between central banks on the one hand, shareholders and fiscal authorities on the other hand and avoids that monetary policy is held hostage of financial or fiscal dominance. Liquidity ought to be provided to the banking system as needed, but it should not be a substitute for a lack of capital.

Thank you for your attention.