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Uwe Vollmer\*

# Do We Need a European Lender of Last Resort?

*During a financial crisis, pressure on Central banks to act as a lender of last resort (LLR) and to offer emergency liquidity assistance to troubled banks increases. The European Central Bank, however, has announced that it does not regard it as its principal task to provide emergency liquidity to troubled banks and that it does not wish to disclose the conditions and practicalities of emergency liquidity assistance arrangements. In this paper, we investigate the benefits and the costs of centralising the LLR function in a monetary union and ask whether establishing an LLR in Europe could be useful.*

Banks are fragile institutions which issue liquid demandable deposits and channel funds received into illiquid assets. This liquidity provision may cause a bank run, i.e. a situation where even depositors without liquidity needs dissolve their deposits. The interbank market may not be able to shield banks from such an occurrence. A run on a single bank can spread to other banks if banks mistrust each other or if depositors think that there are similarities between bank portfolios. Such contagion may result in a bank panic and may cause a systemic banking crisis, which is socially costly because banks are forced to liquidate investments with a positive net present value.

The provision of emergency liquidity by the central bank (CB) as a lender of last resort (LLR) may protect banks against these incidents.<sup>1</sup> While central banking laws in many countries stipulate that the central bank must act as a lender of last resort, the Treaty of the European Union has left the identity of the LLR open in the European Monetary Union. The European Central Bank (ECB) does not regard it as its principal task to provide emergency liquidity to troubled banks. This was made clear by the former ECB president Wim Duisenberg in 1999. He declared:

“The main guiding principle within the Eurosystem with reference to the provision of emergency liquidity to individual financial institutions is that the competent national central bank would be responsible ... For the markets it would be sufficient to know that there is a clearly articulated capability and willingness to act if really necessary. It is not common practice amongst central banks to disclose the conditions and practicalities of emergency liquidity assistance arrangements. In particular, there are typically no official documents describing the conditions under which emergency liquidity

would be extended or what procedures would be followed. Indeed, ex ante commitments would be counter-productive in this field, since they would restrict the ability of the central bank to act to contain systemic disturbances with unforeseen features. Moreover, this policy of ‘constructive ambiguity’ can limit the associated problem of moral hazard.”<sup>2</sup>

With respect to an LLR function, the European Central Bank follows a policy stance similar to the Deutsche Bundesbank. The Deutsche Bundesbank has declared that it will not provide liquidity to individual insolvent banks nor act as a lender of last resort to deposit insurance schemes. This is done to avoid possible conflicts of interest between a central bank’s function in monetary stabilisation policy and the safeguarding of financial markets.<sup>3</sup> If the failure of a bank overburdens the financial capacity of a deposit insurance scheme or endangers the entire banking system - a case of “too big to fail” (TBTF) - the Bundesbank considers it to be the political task of the government to decide what has to happen. In order to avoid moral hazard this action should not be calculable in advance; hence, the Bundesbank favours “constructive ambiguity” and does not want to base LLR assistance on a set of predetermined principles.<sup>4</sup>

<sup>1</sup> Another possibility is deposit insurance schemes, which exist in all major European countries. Note that deposit insurance and LLR are not identical. One difference is that the LLR also covers the losses of uninsured claim holders. Another is that deposit insurance schemes do not cover interbank deposits.

<sup>2</sup> W. Duisenberg: Introductory Statement Delivered on the Occasion of the Presentation of the ECB’s Annual Report to the European Parliament, Strasbourg, 26 October 1999.

<sup>3</sup> Deutsche Bundesbank could provide emergency liquidity to troubled banks through the “Liquiditäts-Konsortialbank (Liko-Bank)” founded in 1974. Liko-Bank is a private liquidity supplier commonly owned by Deutsche Bundesbank (30%) and the German banking federations (70%). However, such liquidity assistance has rarely been reported yet.

<sup>4</sup> Cf. Deutsche Bundesbank: Deposit Protection Schemes in the Federal Republic of Germany, in: Monthly Report of the Deutsche Bundesbank, July 1992, pp. 28-45, here p. 33.

\* Professor of Economics, University of Leipzig, Germany. This paper was written while the author was at Kobe University, Japan, as a visiting scholar. He would like to thank Kobe University (especially Ralf Bebenroth) very much for its generous hospitality, and the DAAD and JSPS for financial support.

While the European Central Bank itself does not act as an LLR (except when the smooth functioning of the payment system is in danger), it does allow national central banks (NCBs) to fulfil this function. If a financial institution becomes illiquid, the relevant NCB should be in charge.<sup>5</sup> Because this policy stance has been criticised in the literature,<sup>6</sup> we investigate in this paper the benefits and costs of centralising the LLR function in a monetary union and ask whether establishing an LLR in Europe would be useful.

### A Review of the Literature

The classical argument for a central bank to act as an LLR is based on the reasoning of Walter Bagehot, who proposed that the Bank of England should announce in advance its readiness to lend against collateral any amount to a solvent but illiquid financial institution at a penalty rate of interest.<sup>7</sup> Bagehot suggested that during a financial crisis the central bank should lend freely at interest rates higher than pre-crisis levels to any good borrower. Quality standards on collateral should be relaxed during crises, but banks without good collateral were assumed to be insolvent and should be allowed to fail.

While Bagehot was quite clear as to the situation in which he recommended that the Bank of England function as an LLR, today the term LLR is used in the literature in different ways. In most cases, LLR means the discretionary provision of emergency liquidity on special terms to a single financial institution or to the market as a whole; it is usually the function of the central bank.<sup>8</sup> This definition will be used in this paper, too, because it precludes regular liquidity provisions via the discount window. Such a possibility, of course, exists in the European Monetary Union in the form of the "marginal lending facility", through which the Eurosystem provides overnight liquidity to a financial institution against collateral at a penalty rate (which is regularly 100 basis points above the minimum bid rate

on "main refinancing operations").<sup>9</sup> Since the marginal lending facility is not pertinent to the discussion of a European LLR, the following will consider an additional LLR function provided at discretion.

Discretionary central bank emergency lending to an illiquid but solvent financial institution can be seen as a reaction to a failure of the interbank market in which a transfer of liquidity from one financial institution to another is impossible.<sup>10</sup> Normally, a solvent bank can borrow required liquidity via the interbank market. Inability to do so indicates that the bank is not regarded as solvent. However, circumstances can exist in which the interbank market does not work smoothly, since it is hard to differentiate between solvency and liquidity: market participants may lack information and doubts may arise as to whether a financial institution is sound. In that case, having a central bank act as an LLR may improve the situation if the central bank has supervisory powers and more accurate information than the market.<sup>11</sup>

Moreover, in times of crisis the interbank market may become more cautious. If liquidity problems are small, banks with a liquidity surplus can lend to a large number

<sup>9</sup> Some authors argue that even liquidity provision under the marginal lending facility is discretionary because the NCBs have full discretion to decide whether or not collateral presented by a borrowing institution is accepted; cf. X. Freixas, B. M. Parigi, J. C. Rochet: *The Lender of Last Resort: A 21st Century Approach*, in: *The Journal of the European Economic Association*, Vol. 2, No. 6, 2004, pp. 1085-1115. This, however, will change in the near future because the Eurosystem will introduce a common collateral framework.

<sup>10</sup> Such a failure of the interbank market was, for example, observed during the recent subprime crisis in 2007/8 and the Japanese financial crisis in the 1990s. After the failure of Sanyo Securities in November 1997, the Japanese interbank call market collapsed because Sanyo was a major borrower. Lender banks decided to place their liquidity with the Bank of Japan instead of lending in the interbank market, because they feared being caught by more defaults. Some years later, the Japanese call market collapsed again because interest rate margins became so small that they did not even cover transaction costs. On these Japanese episodes cf. H. Nakaso: *The Financial Crisis in Japan During the 1990s: How the Bank of Japan Responded and the Lessons Learnt*, BIS Papers No. 6, Basel, October 2001; N. Baba, S. Nishioka, N. Oda, M. Shirakawa, K. Ueda, H. Ugai: *Japan's Deflation, Problems in the Financial System and Monetary Policy*, BIS Working Paper No. 188, Basel, November 2005.

<sup>11</sup> Cf. e.g. A. Berger, S. Davies, M. Flannery: *Comparing Market and Regulatory Assessments of Bank Performance: Who Knows What When?*, Federal Reserve Board, Working Paper, Washington 1998. While some studies indicate that this may indeed be the case, information may also be passed onto the market by the CB without its acting as an LLR. If the CB has less accurate information, however, the opposite may occur and financial assistance offered to banks could be seen by market participants as a signal that the bank has financial problems. Again, the Japanese experience is interesting in this respect: in February 1998 the Japanese government offered financial help to non-failed banks to be channelled into the banking sector via a newly created Financial Crisis Management Committee which had, however, only limited access to supervisory information. Because they feared being singled out as a weak bank, banks were reluctant to apply for capital injections; thus, all banks collectively applied for capital injections but the capital injected was far less than intended by the Japanese government. Cf. again H. Nakaso, op. cit., pp. 11-12; and, for US banks, C. Furfine: *The Reluctance to Borrow from the Fed*, in: *Economics Letters*, Vol. 72, No. 2, 2001, pp. 209-213.

<sup>5</sup> The NCBs in the euro area are therefore LLRs without having their own monetary policy responsibilities. Cf. G. S. Schinas, P. G. Teixeira: *The Lender of Last Resort in the European Single Financial Market*, IMF Working Paper WP06/127, Washington 2006.

<sup>6</sup> Cf. e.g. X. Vives: *Restructuring Financial Regulation in the European Monetary Union*, in: *Journal of Financial Services Research*, Vol. 19, No. 1, 2001, pp. 57-82, here p. 64.

<sup>7</sup> Cf. W. Bagehot: *Lombard Street: A Description of the Money Market*, London 1873. For a thorough overview of the literature see also X. Freixas, C. Giannini, G. Hoggarth, F. Soussa: *Lender of Last Resort: What have we Learned since Bagehot?*, in: *Journal of Financial Services Research*, Vol. 18, No. 1, 2004, pp. 63-84, on which this section heavily draws.

<sup>8</sup> Such a central bank's credit is sometimes also called "emergency liquidity assistance". See Sveriges Riksbank: *The Riksbank's Role as Lender of Last Resort*, Financial Stability Report, No. 2, 2003, Stockholm, p. 58.

of illiquid banks and diversify risks, which makes the overall return from lending acceptable. In times of crisis, however, this risk diversification becomes impossible for a single lending bank because it does not possess enough surplus liquidity. In this case, there is scope for the CB to lend to all illiquid banks even without possessing more accurate information than other market participants.<sup>12</sup> Finally, banks may become reluctant to lend on the interbank market because they fear being unable to borrow in the interbank market themselves in order to address their own possible liquidity problems; hence, expectations become self-fulfilling. The CB as an LLR may then ensure the banks that they will get the necessary liquidity in the case of such a shortage.<sup>13</sup>

Early proponents of an LLR policy, like Bagehot, were only concerned with the consequences of bank failures on the overall money supply. They argued that distributional problems, where liquidity is not efficiently recycled from one bank to another, should not be of concern to the CB. The LLR function was regarded as a liquidity provision to the market as a whole. The failure of a single solvent bank could, however, have systemic consequences. If they engage in relationship lending, banks are not perfect substitutes; if they fail, the relationship is lost and the borrower cannot find a new lender and may be forced to liquidate his investment project.<sup>14</sup> This special characteristic of banks leads to the argument that banks are often “too big to fail” and too important for a region or for a whole economy to go bankrupt.

Interbank market risk exposure may also cause systemic risk. Interbank lending is often unsecured so that the failure of one financial institution may lead to the failure of another institution which has loans outstanding on the first institution. The exposure of a single bank to interbank market risk depends on how the settlement and payment arrangement operates. Exposure is high in systems with uncollateralised deferred net settlements, where payment instructions between banks are netted and settled in time intervals of a couple of hours; during this time the receiving bank is exposed to the sending bank. Interbank market risk is smaller in a

real-time gross settlement system because the central bank settles payments in real time and bank exposure is almost eliminated.<sup>15</sup> While this system consumes much liquidity, it minimises systemic risks; it especially prevents gridlock, i.e. a situation whereby transactions are paralysed due to a chain reaction from an initial delay in payments.

Finally, a run on a single bank can escalate to a systemic-wide bank panic if depositors suspect similarities between banks. These similarities may originate from specialisation in similar types of business or in geographic areas so that banks hold similar assets. If depositors base their decision to withdraw on such similarities, i.e. depositors in similar banks withdraw while depositors in dissimilar banks do not, such a bank run is called “information-based”; if depositors withdraw without any similarities, such a situation is called a “pure panic” contagion.<sup>16</sup> While there is some evidence of the existence of information-based contagion, pure panics seem to be very rare events.<sup>17</sup>

Because the failure of an insolvent financial institution could also have systemic consequences, central banks could also consider the provision of risk capital as part of their LLR function.<sup>18</sup> This is justified by the argument that a bank’s liquidation value is lower than its market value as a going concern and it may be less costly to bail out an insolvent bank than to liquidate it – even systemic risk aside. Besides, the CB may not have enough time to come to a firm conclusion about a bank’s solvency. On the other hand, the provision of risk capital by an LLR could extend the life of a bank that ultimately fails and thereby increase the losses to the deposit insurance scheme. Such concerns are reported in the USA where a large number of the banks that failed between 1985 and 1991 were borrowing

<sup>12</sup> Cf. M. Flannery: Financial Crises, Payment System Problems, and Discount Window Lending, in: *Journal of Money, Credit, and Banking*, Vol. 28, No. 4, 1996, pp. 804-824.

<sup>13</sup> Cf. X. Freixas, B. M. Parigi, J. C. Rochet, *op. cit.*

<sup>14</sup> On the relevance of relationship lending for the provisioning of liquidity through banks cf. D. Diamond, R. Rajan: Liquidity Risk, Liquidity Creation, and Financial Fragility: A Theory of Banking, in: *Journal of Political Economy*, Vol. 109, No. 2, 2001, pp. 287-327. The problem may be reinforced by the fact that capital-poor firms do not have access to capital markets but depend on intermediated finance. Cf. B. Holmström, J. Tirole: Financial Intermediation, Loanable Funds, and the Real Sector, in: *Quarterly Journal of Economics*, Vol. 112, No. 3, 1997, pp. 663-691, for a model where an investor’s access to bank finances depends on his capital endowment.

<sup>15</sup> Central banks in the USA, Japan and EMU all use real-time gross settlement systems but with different exposures to risk. The US Fed and the Bank of Japan provide uncollateralised intraday liquidity to facilitate the real-time settlements and take on the risk. The Eurosystem only provides liquidity against collateral using its Trans-European Automated Real-Time Gross Settlement Transfer System (TARGET) where NCBs compensate their positions daily.

<sup>16</sup> For a paper that models information-based runs cf. V. V. Chari, R. Jagannathan: Banking Panics, Information, and Rational Expectations Equilibrium, in: *Journal of Finance*, Vol. 43, No. 3, 1988, pp. 749-761. The classical reference for a model in which a panic can occur is D. W. Diamond, P. H. Dybvig: Bank Runs, Deposit Insurance, and Liquidity, in: *Journal of Political Economy*, Vol. 91, No. 3, 1983, pp. 401-419.

<sup>17</sup> Cf. G. Kaufmann: Bank Contagion: A Review of the Theory and Evidence, in: *Journal of Financial Services Research*, Vol. 8, No. 2, 1994, pp. 123-150.

<sup>18</sup> During the Japanese financial crisis, authorities injected risk capital into failed financial institutions and into banks which were about to fail. At the beginning of the crisis this was done by Bank of Japan, and later by the Japanese deposit insurance scheme; cf. H. Nakaso, *op. cit.*



from the Federal Reserve System.<sup>19</sup> This led to the passage of the Federal Deposit Insurance Corporation Improvement Act (FDICIA) which restricts Fed lending to banks that do not meet minimum capital requirements and makes the Fed under certain circumstances liable to the deposit insurance scheme for losses resulting from loans to undercapitalised banks.<sup>20</sup>

In situations where a CB is ready to act as an LLR or to provide risk capital, it should be clear on this and could explicitly state the conditions under which it will provide emergency liquidity to failing institutions. The Bank of Japan, for example, has a mandate under Article 38 of the Bank of Japan Law to provide liquidity and to keep a failed bank in operation: it wishes to base the policy judgment on whether or not to provide LLR assistance on a set of predetermined principles in order to increase transparency and accountability.<sup>21</sup> Unlike the Bank of Japan, however, neither the European Central Bank nor the Deutsche Bundesbank are predictable as to whether or not they will provide LLR assistance; they both follow the concept of “constructive ambiguity” – as do many other CBs. This contrasts with the classical view expressed by Bagehot, who demanded that the CB should make clear in advance its readiness to lend to solvent banks without limit.

### Why “Constructive Ambiguity”?

While an LLR may shield the banking sector from financial crises, the drawback is that depositors lose any incentive to monitor banks. Furthermore, an LLR creates moral hazard for commercial banks as they are insured against mismanagement of all types of risks. To limit these adverse effects Bagehot had already suggested providing LLR liquidity to the market only at a penalty rate, i.e. at an interest rate higher than the market rate. Demanding a penalty rate, however, may aggravate the bank’s solvency problem and it may also send signals to market participants that the bank is in trouble; moreover, it may even give an incentive to managers to “gamble for resurrection”,

i.e. to invest in projects with higher risks and higher returns in the hope of surviving.<sup>22</sup>

Constructive ambiguity may be a device to constrain moral hazard.<sup>23</sup> It can be defined as a situation in which the CB retains discretion as to whether, when and under what conditions financial support will be provided to an individual financial institution.<sup>24</sup> If the CB keeps secret whether or not financial support will be granted, individual banks will not know whether or not they will be rescued; moreover, this might prevent imitation effects. If the CB is ambiguous about the conditions of financial assistance, this keeps a bank’s shareholders and management uncertain as to the costs they would have to bear.<sup>25</sup>

These beneficial effects of constructive ambiguity assume, however, that:

- individual liquidity assistance to individual banks is preferable to market assistance to all banks;
- randomising the unconditional rescue of banks is preferable to both a “pure strategy” (where the CB either always liquidates or always bails out a distressed bank) and a discretionary policy (where the CB selects the policy which is best given the current situation).

The first assumption may be justified for bank-based financial systems where relationship lending plays a dominant role and banks cultivate “home bank” relationships with their customers.<sup>26</sup> In that case, discretionary financial assistance to individual banks may indeed be preferable because it allows the banker to

<sup>19</sup> Cf. S. Santomero, P. Hoffman: Problem Bank Resolution: Evaluating the Options, in: The Wharton School, Financial Institutions Center, Discussion Paper 98-05, 1998.

<sup>20</sup> Cf. R. A. Gilbert: Federal Reserve Lending to Banks that Failed: Implications for the Bank Insurance Fund, in: Federal Reserve Bank of St. Louis, Quarterly Review, January / February 1994, pp. 3-18.

<sup>21</sup> Cf. H. Nakaso, op. cit., p. 28. Sveriges Riksbank also prefers clear principles for emergency liquidity assistance; cf. Sveriges Riksbank, op. cit. New Zealand was also a case with a clear position – but in the opposite direction; here, government guarantees of deposits and other bank liabilities were absent; cf. J. Enoch, P. Stella, M. Khamis: Transparency and Ambiguity in Central Bank Safety Net Operations, International Monetary Fund, Working Paper WP/97/138, Washington 1997.

<sup>22</sup> For models with such a risk-shifting effect see X. Freixas, B. M. Parigi, J. C. Rochet: Systemic Risk, Interbank Relations, and Liquidity Provision by the Central Bank, in: Journal of Money, Credit, and Banking, Vol. 32, No. 3, 2000, pp. 611-638; R. Repullo: Liquidity, Risk Taking, and the Lender of Last Resort, in: International Journal of Central Banking, Vol. 2, No. 2, 2005, pp. 47-80. J. C. Rochet, X. Vives: Coordination Failures and the Lender of Last Resort: Was Bagehot Right After All?, in: Journal of the European Economic Association, Vol. 2, No. 6, 2004, pp. 1116-1147, also argue that a low rate on emergency liquidity assistance is optimal.

<sup>23</sup> The term “constructive ambiguity” is also used in other fields, e.g. in exchange-rate economics, to denote a situation where ambiguity about foreign exchange interventions is created intentionally. Cf. P. Chiu: Transparency versus Constructive Ambiguity in Foreign Exchange Intervention, BIS Working Papers, No. 144, Basel 2003.

<sup>24</sup> Cf. Bank for International Settlements: G 10 Report on Financial Stability in Emerging Market Economies, Basel, April 1997.

<sup>25</sup> Cf. X. Freixas, C. Giannini, G. Hoggarth, F. Soussa, op. cit., pp. 74-75. On the other hand, the Sveriges Riksbank, op. cit., argues that making the emergency liquidity assistance provided by the CB public information should be a sufficient incentive for a bank to request assistance only when it is really needed.

<sup>26</sup> F. Fecht, M. Tyrell: Optimal Lender of Last Resort Policy in Different Financial Systems, Deutsche Bundesbank. Discussion Paper Series 1: Studies of the Economic Research Centre, No. 39, 2004, Frankfurt/Main.

keep his knowledge about the next-best use of a lender's projects.

A rationale for the second assumption is provided by Freixas<sup>27</sup> who shows that a CB may, by committing to a mixed strategy, reduce *ex ante* risk-taking incentives at the cost of *ex post* inefficient bank closures; the optimal bail-out policy is a mixed strategy if the first effect is preferred to the second one. To clarify this argument, remember that a pure bail-out strategy – where no bank owner, bank manager or depositor would ever suffer losses – implies an open-ended fiscal involvement and generates moral hazard effects. On the other hand, a pure no-bail-out strategy minimises fiscal costs and moral hazard but also implies that the CB bears the costs of bank closures, including the opportunity costs of forgone financial intermediation or systemic costs in the form of gridlock in the payment system.<sup>28</sup> Discretionary financial assistance leads, eventually, to time-inconsistency in the CB's closure policy: while it is in the interest of the CB to deny its willingness to bail out *ex ante*, *ex post* it might be optimal to offer financial assistance; this in turn influences the commercial banks' strategy and induces them to choose a larger and riskier asset portfolio.<sup>29</sup>

As a consequence, the CB should make use of conditionality and make financial assistance conditional on the amount of uninsured debt issued by the failing bank.<sup>30</sup> If the central bank is able to commit to a policy, it should follow a mixed strategy for small banks, i.e. exercising constructive ambiguity for all financial institutions below the uninsured debt requirement, but never bail out a distressed bank above the debt requirement. Such a mixed strategy will always be preferable to a policy of systematic liquidation, because some inefficient liquidation is prevented; investors expend more effort in monitoring the bank, and the bank

will choose a less risky portfolio.<sup>31</sup> Under commitment a CB's ambiguity to provide LLR functions is hence "constructive", because it produces an endogenous uncertainty that reduces moral hazard for commercial banks.<sup>32</sup> Moreover, it is advantageous not to publicly announce this policy because the variable on which it is based is not readily observable or verifiable within the short period of time in which decisions have to be taken.<sup>33</sup>

The preceding argument in favour of constructive ambiguity, however, ignores possible long-term effects of a bail-out on a bank's charter value: if a CB announces and commits to bailing out insolvent banks in case of an adverse macroeconomic shock that is beyond the control of bank managers, it increases the probability of survival and raises the value of the bank charter; this creates a risk-reducing "value effect" which more than offsets the moral hazard effect of a bail-out policy.<sup>34</sup> Since after a macroeconomic shock a bank is likely to become insolvent irrespective of its portfolio choice, a policy that publicly announces a rescue in such cases is like an incentive contract which induces little additional risk-taking but increases the bank's value and the incentive to limit overall risk exposure. Thus the CB should *ex ante* be clear that it will stand by as an LLR only in the case of adverse macroeconomic shocks.<sup>35</sup>

Finally, Repullo<sup>36</sup> provides another rationale for "constructive ambiguity": what may be perceived by outsiders as a random policy rule may not be random from the perspective of the CB if it reacts to its own supervisory information. To show this, Repullo considers a CB that acts as an LLR but makes this function dependent on its information about a bank's probability of success, which is assumed to be non-verifiable. The CB maximises its budget but also takes the potential costs of the negative externalities of a bank failure into account. The CB supervises a commercial bank which randomly loses deposits; then, the CB receives a ran-

<sup>27</sup> Cf. X. Freixas: Optimal Bail Out Policy, Conditionality and Constructive Ambiguity, Financial Market Group Discussion Paper 237, London School of Economics, 1999; X. Freixas, C. Giannini, G. Hoggarth, F. Soussa, op. cit.

<sup>28</sup> On the opportunity costs cf. G. J. Mailath, L. J. Mester: A Positive Theory of Bank Closure, in: Journal of Financial Intermediation, Vol. 3, No. 3, 1994, pp. 272-299. On the costs of an interruption in the payment systems cf. X. Freixas, B. M. Parigi, J. C. Rochet, op. cit.

<sup>29</sup> Cf. G. J. Mailath, L. J. Mester, op. cit.; V. V. Acharya, T. Yorulmazer: Too many to fail - An Analysis of Time-inconsistency in Bank Closure Policies, in: Journal of Financial Intermediation, Vol. 16, No. 1, 2007, pp. 1-31.

<sup>30</sup> Cf. X. Freixas, op. cit. Under discretion, i.e. when the CB is not able to commit to randomising, the resulting strategy will be a pure strategy in which the CB will either rescue all banks or liquidate all of them. Note, however, that under certain parameter conditions a systematic bail-out could also be an optimal policy in the pre-commitment case.

<sup>31</sup> Cf. K. Mikkonen: Regulation of Multinational Banks in the European Union. Inaugural-Dissertation at Ludwig-Maximilians-University, Munich 2006, p. 17.

<sup>32</sup> Note that a TBTF policy may be interpreted as the limiting case in which the ambiguity ceases to operate when the bank in distress is large. Cf. X. Freixas, op. cit., p. 3.

<sup>33</sup> Ibid., p. 20.

<sup>34</sup> Cf. T. Cordella, E. Levy-Yeyati: Bank Bailouts: Moral Hazard vs. Value Effect, in: Journal of Financial Intermediation, Vol. 12, No. 4, 2003, pp. 300-330.

<sup>35</sup> This seems to be the reason why Bank of Japan did not maintain constructive ambiguity in the 1990s. Cf. H. Nakaso, op. cit., p. 28.

<sup>36</sup> R. Repullo: Who Should Act as a Lender of Last Resort? An Incomplete Contracts Model, in: Journal of Money, Credit, and Banking, Vol. 32, No. 3, 2000, pp. 291-312.

dom and non-verifiable signal about the commercial bank's solvency and decides whether or not to act as an LLR.

Under "constructive ambiguity" the CB makes financial assistance dependent on the outcome of the signal which cannot be observed by outsiders. Compared to the benchmark case of an optimal LLR policy with a verifiable signal the CB is either too soft or too tough: it is too soft when deposit withdrawals are small, i.e. it supports a commercial bank which should be closed ("excessive forbearance"); on the other hand, the CB is too tough when deposit withdrawals are large, i.e. it does not lend to a commercial bank which should be supported. This outcome can be compared with a policy in which the CB is not ambiguous but chooses a pure strategy, i.e. it either always bails out or always liquidates a troubled bank. In the case of bailing out, the CB is always too soft and never too tough, while in the case of always liquidating, the opposite applies. In Repullo's model, expected welfare costs may be smaller under ambiguity than under each pure strategy.<sup>37</sup>

To summarise, an ambiguous CB policy as to whether, when and under what conditions financial assistance may be offered may indeed be constructive if macroeconomic conditions are unstable because this policy constrains risk-taking on the part of commercial banks. However, it introduces some randomisation into the CB's policy because the decision to provide LLR help cannot be based on predetermined principles; hence, "constructive ambiguity" somehow contradicts the principles of transparency and accountability, which are often regarded as being of fundamental importance for a "young" institution like the ECB. To this institution we shall now turn.

### Virtues of a European LLR

Financial market integration in Europe is still low. In the recent past, however, multinational ("pan-European") banking groups have emerged in Europe through mergers and acquisitions, which provide wholesale services in more than one member state. As multinational banks (MNBs), they have a parent bank in one country and conduct business in several EU member states through branches or subsidiaries which are established as greenfields or acquired through take-

overs.<sup>38</sup> Branches are elementary parts of the parent bank which are liable for their losses; if the branch goes bankrupt, the assets of the parent bank are affected. Subsidiaries are independent units in which limited liability holds and the parent bank is shielded from the subsidiary's losses. A subsidiary can go bankrupt independently of the parent bank. Whereas branches can be opened everywhere in the EU and are regulated and supervised by the regulator of the parent bank's country, subsidiaries need to be licensed in each country of operation. They fall under the responsibility of the host country regulator and host country NCB. Deposits are protected by the home country's insurance scheme in the case of branches (unless the branch wants to join the host country insurance scheme) and by the local insurance scheme in the case of subsidiaries.<sup>39</sup>

Pan-European banking groups play an active role on European money markets and often act as suppliers of liquidity to smaller banks in the interbank market. Moreover, they are major participants in the clearing and settlement system as well as in the main payments systems; funds are shifted via bank-internal capital "markets" from one branch or subsidiary to another.<sup>40</sup> If these banks experience a major liquidity shock in one money market, they can forward this liquidity shortage to another market, i.e. withdraw liquidity there and transfer these funds to the market where the liquidity shock has occurred.<sup>41</sup> This may lead to systemic impli-

<sup>38</sup> According to T. Padoa-Schioppa: Central Banks and Financial Stability: Exploring the Land in Between, in: V. Gaspar et al. (eds.): The Transformation of the European Financial System, Frankfurt/Main 2003, pp. 269-310, there are around 40 banking groups in Europe, which are on average present in six member states; some of them are present in all member states.

<sup>39</sup> G. Calzolari, G. Loranth: Regulation of Multinational Banks. A Theoretical Inquiry, European Central Bank, Working Paper Series, No. 431, Frankfurt/Main 2005, p. 8.

<sup>40</sup> I. Cabral, F. Dierick, J. Vesala: Banking Integration in the Euro Area. European Central Bank Occasional Paper, Frankfurt/Main 2002; M. Campello: Internal Capital Markets in Financial Conglomerates: Evidence from Small Bank Responses to Monetary Policy, in: Journal of Finance, Vol. 57, No. 6, 2002, pp. 2773-2805; A. B. Ashcraft, M. Campello: Firm Balance Sheet and Monetary Policy Transmission, in: Journal of Monetary Economics, Vol. 54, No. 6, 2007, pp. 1515-1538.

<sup>41</sup> For empirical evidence on the existence of bank-internal capital markets in 45 of the largest banking groups from 1992 to 2004 see R. de Haas, I. Naaborg: Foreign Banks in Transition Countries: To Whom do They Lend and How are they Financed?, in: Financial Markets, Institutions and Instruments, Vol. 15, No. 4, 2006, pp. 159-199; R. de Haas, I. van Lelyveld: Internal Capital Markets and Lending by Multinational Bank Subsidiaries, DNB Working Paper No. 101, Amsterdam, June 2006. They find a significant and negative relationship between home country economic growth and host country credit by foreign bank subsidiaries. There is also evidence that Japanese bank subsidiaries in the United States cut their local lending much more significantly than the parent bank in its home market; cf. J. Peek, E. S. Rosengren: The International Transmission of Financial Shocks: The Case of Japan, in: American Economic Review, Vol. 87, No. 4, 1997, pp. 495-505.

<sup>37</sup> This is shown in C. M. Kahn, J. A. Santos: Who Should Act as Lender of Last Resort? An Incomplete Contracts Model: A Comment, in: Journal of Money, Credit, and Banking, Vol. 38, No. 4, 2006, pp. 1111-1118.

cations for the interbank market where funds are withdrawn and hence there is enormous pressure on the local NCB to act as an LLR, especially in the case of a subsidiary MNB. Since multinational banks can choose from which money market they withdraw funds, “winner picking” is possible, i.e. they may choose the market where LLR assistance is most likely. Central banks indeed express their concern that they may be blackmailed and get into a situation “where an institution suffering problems utilizes its systemic importance to demand support on favorable terms”.<sup>42</sup>

In this situation, the question raised is which central bank will act as an LLR and on what terms. Without a European LLR, two alternatives are conceivable:<sup>43</sup> the NCB where the group’s parent or main bank is located meets the liquidity needs of the whole group; or each member bank in the group receives financial assistance from the NCB of the country in which it is licensed. The two possibilities imply different forms of credit-risk sharing between the NCBs. In the first case, the NCB of the parent bank’s country would bear the full credit risk with regard to the banking group while in the second case this would be shared among NCBs. In the second case, however, there would be some risk-taking among NCBs that would not be straightforward if the group had a liquidity management centre. Moreover, conflicts of interest between NCBs are possible, especially if the bank’s sizes differ in the home and in the host country; in such scenarios, NCBs might apply different criteria for providing financial assistance that have to be coordinated.

To handle a possible failure of such a pan-European banking group, in 2003 the Nordic countries agreed on a multinational coordination model for the performance of the LLR function vis-à-vis a multinational banking group with operations in two or more countries.<sup>44</sup> They established a structure for crisis management and dissemination of relevant information and agreed that in a crisis emergency liquid assistance will only be provided if the bank is not judged to be insolvent. The assessment of the need for such policy measures will be made by a “crisis management group” which will be activated by the CB that was the first to identify the potential crisis. The CB of the country in which the parent bank is located has the responsibility for coordinating the group’s continued work.

While such ad hoc coordination may be operable among a small group of five central banks, as in the Nordic countries case, one may have second thoughts whether the same arrangement is viable in the European Monetary Union with its current 16 members.<sup>45</sup> In case of a systemic crisis, timely and swift decisions have to be made; yet it takes time for the NCB presidents to gather and to make decisions.<sup>46</sup> Moreover, the systemic impact of pan-European bank failures differs among member countries. Therefore, the “Nordic model” does not seem to be appropriate for EMU. As such, there is indeed a need for a European LLR function in case of failures of multinational banks. Moreover, such a centralised LLR may prevent too excessive interventionism by national NCBs. National authorities will be more likely than the ECB to yield to pressure groups that demand the rescue of failed banks that are TBTF with respect to the home country. If, for example, a big German bank fails, the German government is likely to exert pressure on the Bundesbank to bail out this bank because of its national importance. This pressure will be much smaller in the ECB Council, in which the Deutsche Bundesbank currently has only one vote among 22 Council members.

Aside from the systemic effects of failing multinational banks, the current existing institutional allocation of LLR functions and bank supervision in Europe may also have efficiency implications. It may result in a too high level of forbearance in closing distressed banks and a too low level of diligence in bank supervision.<sup>47</sup> If a bank fails, national NCBs look only at the consequences for the national market, even if the failure has consequences for foreign markets, too. Foreign depositors and foreign deposit insurance schemes may bear some of the costs of the failure, and the failure of the foreign bank may have systemic consequences in the host country. This externality increases with the progressive integration of banking markets but the trend

<sup>42</sup> Sveriges Riksbank, op. cit., p. 65.

<sup>43</sup> Cf. G. S. Schinasi, P. G. Teixeira, op. cit., pp. 11-12.

<sup>44</sup> This was agreed upon in a memorandum of understanding (MoU) between Denmark, Iceland, Finland, Norway and Sweden after the failure of Nordea, the largest Nordic banking group. A similar MoU was signed between Sweden and the Baltic states in 2005. Cf. Ibid.

<sup>45</sup> Ibid., p. 17.

<sup>46</sup> Decision-making costs are also a major reason why interest-rate changes are made in large time intervals and in steps of 25, 50 or 75 basis points. Cf. K. Gerlach-Kristen: Taking Two Steps at a Time: On the Optimal Pattern of Policy Interest Rates, in: *Journal of Economic Dynamics and Control*, Vol. 32, No. 2, 2008, pp. 550-570; H. P. Grüner, K. Gerling, A. Kiel, E. Schulte: Information Acquisition and Decision Making in Committees: A Survey, in: *European Journal of Political Economy*, Vol. 21, No. 3, 2005, pp. 563-597.

<sup>47</sup> On the following cf. C. M. Kahn, J. A. Santos: Allocating the Lender of Last Resort and Supervision in the Euro Area, in: V. Alexander, J. Melitz, G. M. von Furstenberg (eds.): *Monetary Unions and Hard Pegs – Effects on Trade, Financial Development, and Stability*, Oxford, New York 2004, pp. 347-360. For models that discuss the institutional allocation of regulatory powers in a non-European context cf. R. Repullo, op. cit.; C. Kahn, J. A. C. Santos: Allocating Bank Regulatory Powers: Lender of Last Resort, in: *European Economic Review*, Vol. 49, No. 8, 2005, pp. 2107-2136.



is reversed if LLR and supervisory functions are centralised.<sup>48</sup> Moreover, a lack of overall standardisation might result in spillovers if commercial banks offer cross-border financial services and CBs exercise national closure policies. In this case, commercial banks in more forbearing regimes take higher risks and force commercial banks in less forbearing countries to exit the banking system unless their central banks adopt greater forbearance.<sup>49</sup>

### Constructive Ambiguity as to the Identity of the LLR in EMU?

As mentioned in the introduction, the EU Treaty is ambiguous as to the identity of the LLR and does not specify who is responsible for emergency liquid assistance in a financial crisis. The ECB has delegated this task to the NCBs but reserved itself the right to intervene if necessary. Critics argue that this ambiguity as to responsibilities may cause delays in decision-making, may induce coordination problems between NCBs and the ECB and may raise the costs of bank resolutions; this may damage the credibility of EMU. Moreover, ambiguity with respect to mandates may lead to “regulatory moral hazard”, i.e. a situation where NCBs are too compliant regarding bank supervision because they rely on the ECB and its willingness to avoid systemic disruptions.<sup>50</sup> ECB representatives responded to such criticism by arguing that critics overestimate systemic risks and underestimate the Eurosystem’s capacity to act.<sup>51</sup> Accordingly, the Eurosystem is equipped with the decision-making bodies that could react quickly. For the markets a clear reassurance about the capacity to act when needed is sufficient. Finally, a CB’s explanation of the procedures taken should be given *ex post* but not *ex ante*, since what counts is *ex post* transparency, not *ex ante* transparency.

<sup>48</sup> For a model in a similar vein cf. G. Dell’Ariccia, R. Marquez: Competition among Regulators and Credit Market Integration, in: Journal of Financial Economics, Vol. 79, No. 2, 2006, pp. 401-430. The authors show that externalities lead regulators to choose suboptimal low capital adequacy standards; hence a “competition in laxity” may occur.

<sup>49</sup> Cf. V. V. Acharya: Is the International Convergence of Capital Adequacy Regulation Desirable?, in: Journal of Finance, Vol. 58, No. 6, 2003, pp. 2745-2781.

<sup>50</sup> Cf. A. Prati, G. Schinasi: Will the European Central Bank be the Lender of Last Resort in EMU?, in: M. Artis, A. Weber and E. Hennessy (eds.): The Euro. A Challenge and Opportunity for Financial Markets, London 2000, pp. 227-256; F. Bruni, C. De Boissieu: Lending of Last Resort and Systemic Stability in the Eurozone, in C. A. E. Goodhart (ed.): Which Lender of Last Resort for Europe?, London 2000, pp. 175-196.

<sup>51</sup> On this and the following cf. T. Padoa-Schioppa: EMU and Banking Supervision, in: International Finance, Vol. 2, No. 2, 1999, pp. 295-308.

The present division of labour between the ECB and the NCBs regarding emergency liquid assistance may be justified through a special interpretation of “constructive ambiguity” in the sense of appointing two regulators with different mandates and not defining their respective tasks clearly.<sup>52</sup> In the case of EMU, one may imagine that the ECB and NCBs indeed have different goals and follow different bank closure policies that depend on the bank’s size and ownership structure. The ECB as a supranational regulator may internalise the systemic costs everywhere in EMU which depend on the failing bank’s size; but it may, however, disregard deposit insurance costs because they are borne by national deposit insurance schemes. NCBs on the other hand only internalise the national costs of deposit insurance but not systemic costs abroad. Deposit insurance costs depend, furthermore, on the ownership structure of a bank, because a branch structure belongs to the deposit insurance scheme of the home country whereas a subsidiary structure is insured in the host country.

The more a regulator internalises the externalities of commercial bank activity, the more reluctant he is to close the bank. In this situation “constructive ambiguity” with respect to responsibilities may have different meanings. The first interpretation is that the NCB decides whether to grant emergency liquid assistance while the ECB may have a veto right and may act as LLR if the NCB has not provided any emergency liquidity. It turns out that in this scenario “constructive ambiguity” does not have any welfare effects because in the branch bank scenario the ECB is always the stricter regulator. Therefore, the veto right will never be used; the same may apply in the subsidiary bank scenario as well.

The other interpretation of “constructive ambiguity” is not to explicitly appoint the LLR function to any of the CBs.<sup>53</sup> If the CBs are able to commit to a division of responsibilities, some ambiguity in the sense of not specifying the identity of the CB acting as LLR could indeed be constructive – but only for a small class of banks. In all other cases, however, it is better to appoint the LLR function to the stricter regulator according to a rule contingent on size and ownership, i.e. to allocate the regulation of branch banks and small subsidiary structure banks to the ECB and the regulation of large subsidiary structure banks to the NCBs. Hence, in these cases a clear assignment of responsibilities

<sup>52</sup> This idea is developed in K. Mikkonen, op. cit., chapter 3, on which the following draws.

<sup>53</sup> Ibid., p. 63.

and allocating the LLR function to the ECB would be welfare-improving.

### When Will a European Lender of Last Resort Emerge?

The European Central Bank could be assigned supervisory powers at any time without the need for revising the Treaty of the European Union. According to Article 20 of the ECB Statute, the Governing Council may also introduce new monetary policy instruments at any time. ECB credit operations must, however, always be backed by adequate collateral according to Article 18 of the ECB Statute; but the definition of what is regarded as adequate collateral is left to the Governing Council of the ECB. If the ECB can act as a European LLR at any time, why have neither a centralised LLR nor centralised bank regulations yet emerged in EMU?

A possible answer to this question is that the centralisation of bank regulation and LLR functions is not a free lunch but involves costs for NCBs as they lose flexibility in policy design: a centralised regulator has to apply uniform standards to all countries under its jurisdiction.<sup>54</sup> Domestic regulators will only agree to surrender their authority to a supranational authority if the benefits from centralisation are higher than the costs. Since the centralisation of LLR functions and the centralisation of bank regulation have to be decided upon by the Governing Council of the ECB (by a majority of two thirds of the votes cast in the case of LLR) or the European Council (unanimously in the case of bank regulation) the advantages of a centralised LLR and bank regulation have to exceed the disadvantages of centralisation for a voting majority of EU members.<sup>55</sup>

In the case of the LLR function, NCBs in Europe have to agree upon a uniform standard with respect to adequate collateral. Until the end of 2006, there were two tiers of assets that were eligible for being accepted as collateral: tier one assets were marketable debt instruments and tier two assets were non-marketable assets such as loans; tier two assets were approved by the ECB upon recommendation by each NCB.<sup>56</sup> With centralised LLR functions all NCBs will probably have to accept a uniform list of assets acceptable as collateral. This uniformity in collateral creates costs for some

of the NCBs which are higher the more dissimilar their countries are.

If may be argued that dissimilar countries are less likely to opt for a centralised solution to banking regulation and will prefer to maintain independent regulators.<sup>57</sup> Besides, regulatory standards are higher than the highest applied regulatory standard under independent regulation in order for all countries to be better off. This occurs because stricter standards hurt home country banks: to compensate for this effect, home country regulators demand that standards for foreign banks also rise; since every regulator is doing so, standards rise across the board.

Moreover, in a single financial market a regulatory union may fail if the number of countries participating in the regulatory union is not large enough and if the number of outsiders is considerable. This is due to the fact that the tighter standards resulting from the centralised regulation put the merged banking system at a disadvantage compared to the banks outside the regulatory union. Partial integration may also not be a good strategy for achieving full integration because countries outside the union can free-ride on the increased regulation inside the union and will instead prefer to stay outside.<sup>58</sup>

Given these results, it could be predicted that the chances of creating a European LLR will decline as EMU becomes larger and countries continue to join the euro area. Since MNBs are especially dominant in the accessing countries,<sup>59</sup> the situation could arise that the need for a European LLR will increase while at the same time the chances of agreeing upon such a European LLR will decrease.

### Conclusions

In this paper, we have asked whether there is a potential role for the European Central Bank to act as a European LLR and why such a European LLR has not yet emerged. We have argued that the emergence of pan-European multinational banks increases the importance of a having centralised LLR, while the chances of agreeing upon a common European regulatory framework will at the same time shrink as the single European capital market increases. In the case of a liquidity crisis, pan-European banks may be able to choose their regulator and the CB most appropriate for an LLR. A European LLR could prevent such win-

<sup>54</sup> This assumes that it is too expensive for the central regulator to impose different standards across countries.

<sup>55</sup> Cf. G. Dell'Ariccia, R. Marquez, op. cit.

<sup>56</sup> On 1 January 2007, the Eurosystem introduced a single framework for eligible assets to replace the existing system of tier one and tier two assets (which is eventually to be phased out). The new framework comprises marketable and non-marketable assets. The Eurosystem reserves the right to exclude individual assets for collateral purposes regarding credit operations at any time. Cf. [http://www.bundesbank.de/gm/gm\\_sicherheiten.en.php](http://www.bundesbank.de/gm/gm_sicherheiten.en.php).

<sup>57</sup> This is shown by G. Dell'Ariccia, R. Marquez, op. cit., p. 403, who apply the argument to banking regulation, especially capital adequacy ratios, not to LLR functions.

<sup>58</sup> Ibid.

<sup>59</sup> Cf. R. de Haas, I. Naaborg, op. cit., p. 164.

ner picking; NCBs, however, may be reluctant to assign an LLR function to the European Central Bank because centralised regulations imply less policy flexibility.

If the emergence of pan-European multinational banks is of pivotal importance for the emergence of a European LLR, the question arises as to what determines the appearance of multinational banks that have a subsidiary structure. Explanations for different modes of foreign market entry are offered on the basis of, for example, regulations that explicitly favour certain in-

ternationalisation strategies.<sup>60</sup> Others follow the standard approach to multinational firms and apply it to the banking firm in order to explore the internationalisation of banks on the basis of ownership-specific, location-specific, and internalisation advantages.<sup>61</sup> It may also be argued that bank regulation in the form of minimum capital adequacy ratios may affect an international bank's choice between offering deposit-taking and lending services directly to foreign customers (cross-border financial services) and operating locally through direct investment entities, and the choice between branches or legally independent subsidiaries.<sup>62</sup>

<sup>60</sup> E. Cerutti, G. Dell'Ariccia, M. S. Martinez Peria: How Banks Go Abroad: Branches or Subsidiaries, in: *Journal of Banking and Finance*, Vol. 31, No. 6, 2007, pp. 1669-1692.

<sup>61</sup> J. M. Gray, H. P. Gray: The Multinational Bank: A Financial MNC?, in: *Journal of Banking and Finance*, Vol. 5, 1981, pp. 33-63; B. Williams: Positive Theories of Multinational Banking: Eclectic Internationalisation Theory, in: *Journal of Economic Surveys*, Vol. 11, No. 1, 1997, pp. 71-100; C. Buch, A. Lipponer: FDI versus exports: Evidence from German banks, in: *Journal of Banking and Finance*, Vol. 31, No. 3, 2007, pp. 805-826.

<sup>62</sup> Cf. for example D. Dietrich, U. Vollmer: Banks' Internationalization Strategies: The Role of Bank Capital Regulation, Halle Institute for Economic Research, IWH-Discussion Paper No. 18, October 2006; T. Harr, T. Ronde: Regulation of Banking Groups, FRU Discussion Paper No. 2006/01, University of Copenhagen; G. Loranth, A. D. Morrison: Deposit Insurance, Capital Regulation in Multinational Banks, in: *Journal of Business Finance and Accounting*, Vol. 34, Nos. 5/6, 2007, pp. 917-949.