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The European Central Bank as Lender of Last Resort

by Gerhard Illing and Philipp König

In the wake of the recent European debt crisis, the European Central Bank (ECB) has grown significantly in importance. As the crisis worsened, the ECB needed to take measures that went far beyond standard monetary policy operations—particularly with respect to its function as lender of last resort. It provided the banking sector with almost unlimited liquidity and, in addition, purchased government bonds of distressed countries outright. Eventually, in the summer of 2012, it followed through on its promise to do everything possible to save the euro as a common currency. This announcement temporarily stabilized financial markets and the countries in crisis. Nevertheless, compared to other central banks, the ECB is inhibited in its scope of activities: unlike, for example, the US Federal Reserve (Fed), the European Central Bank has no well-defined institutionally anchored fiscal backing. Consequently, the measures it can take are limited by the maximum loss it can incur. This also means that the ECB must protect itself more than other central banks against financial risks from its monetary policy operations. In particular, during a crisis, this restricts its scope for taking measures to fulfill its mandate—securing price stability. Moreover, the ECB has taken on the role of lender of last resort for euro area governments with its announcement in the fall of 2012 to purchase government bonds of distressed countries in the euro area, if necessary, and under strict conditions. It felt forced to do so because the euro area did not have a fiscal institution capable of stopping the crisis worsening and preventing a breakup of the European Monetary Union. At the same time, however, it is indeed questionable whether such activities are included in the ECB's mandate. The European Stability Mechanism (ESM) would, in principle, be better suited to act as a lender of last resort for governments should future crises occur. However, it should be given access to ECB credit facilities in order to fully perform this function.¹

The primary task of the European Central Bank² is maintaining price stability. The decisive factors for achieving this include a stable banking and financial system accompanied by a functioning monetary policy transmission channel, since a central bank can only indirectly control the general level of prices or the rate of inflation.³ Price stability and financial stability⁴ are therefore complementary objectives: without a smoothly functioning financial system, the transmission of monetary policy impulses is very difficult to attain; at the same time, stable price development is crucial for anchoring price expectations and price setting in the financial sector.⁵ To protect commercial banks from default due to illiquidity and the financial system from serious damage and contagion effects during a crisis, a central bank takes on the role of lender of last resort (LLR).⁶

² In the following, the terms “ECB” and “Eurosysteem” are used interchangeably for simplicity.

³ By fixing its key interest rates, a central bank sets the price banks must pay to borrow money from the central bank. In turn, this affects the interest rates on the interbank market; these interest rate changes at the short end of the yield curve also affect longer-term interest rates through arbitrage relationships on the financial markets and ultimately influence investment, savings, and consumption decisions, and hence price and wage changes in the economy.

⁴ Financial stability generally refers to a situation in which the financial system allows for a smooth allocation of real resources through pricing, allocation and management of financial risks (liquidity risk, credit default risk, interest and exchange rate risks, etc.), see G. Schinasi, “Defining Financial Stability,” IMF Working Paper, WP 04/187 (International Monetary Fund, October 2004).

⁵ Hyman Minsky has stated that price stability can even lead to instability in the financial sector if reduced macroeconomic volatility induced by higher price stability is perceived as reducing risks and financial institutions increase their risk-taking. However, this should not be a valid argument to deviate from a goal of price stability but rather speaks in favor of a stronger emphasis on financial stability in the objective function of the central bank and the macro-prudential regulator, see e.g., C. Goodhart, “Lessons for Monetary Policy from the Euro Area Crisis,” *Journal of Macroeconomics*, 39 (Part B) (2004).

⁶ See R. Hawtrey, *The Art of Central Banking*, 2nd ed. (Oxford: Frank Cass and Company Ltd., 1962), 123.

¹ The present report is part of a DIW Economic Bulletin series addressing various elements of a strategy for institutional reform of the euro area. See F. Fichtner, M. Fratzscher, M. Podstawski, and D. Ulbricht, “Making the Euro Area Fit for the Future,” *DIW Economic Bulletin*, no. 9 (2014).

Liquidity Crises and Self-Fulfilling Expectations

Banks finance long-term illiquid and often non-marketable assets to a large extent by short-term liabilities exchangeable at any time for legal tender at their nominal value. This balance sheet structure makes banks fragile because their economic survival depends, in particular, on the expectations of their depositors and creditors: as long as they expect that a bank can always meet its liabilities, there is no reason to withdraw deposits. Yet, it all looks very different when there is a sudden loss of confidence and fears of bank insolvency. Since financial institutions usually only cover a fraction of their deposits with cash or other liquid assets, large deposit withdrawals can even drive an otherwise solvent bank into illiquidity default. Consequently, banks are exposed to situations of multiple equilibria brought about by self-fulfilling expectations: in one equilibrium, say, the “good” equilibrium, they will not get into liquidity difficulties, whereas in the “bad” equilibrium, they may become illiquid and go bankrupt even if they are otherwise solvent.⁷

If a bank is exposed to withdrawals of its deposit liabilities, often its access to the interbank market, where financial institutions borrow money from one another, is also blocked. In a systemic crisis affecting the whole banking system, even the interbank market may collapse in certain circumstances. In such cases, a bank can only generate liquidity through fire-sales of its assets. Since such fire-sales occur at prices below the assets' fundamental values, the bank is threatened by significant losses which can aggravate its liquidity problem and, in fact, may turn it into a solvency problem. If several financial institutions sell similar assets at the same time, downward pressure on prices will mount, resulting in the need for more distressed sales—thus creating a downward spiral.⁸

⁷ See D. Diamond and P. Dybvig, “Bank Runs, Deposit Insurance and Liquidity,” *Journal of Political Economy* 91 (1983): 401-419; 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* 6 (2) (2004): 1116-1147; F. Allen and D. Gale, “Understanding Financial Crises,” *Clarendon Lectures in Finance* (Oxford University Press, 2009).

Bank runs by small customers, as still existed in industrialized countries up until the 1930s can largely be prevented by government deposit insurance today. However, “electronic bankruns” triggered by institutional depositors, money market funds, or other banks not protected by government deposit guarantees and where deposits can usually be withdrawn in a very short period of time are problematic; an example of this is the British bank Northern Rock, outlined by H.-S. Shin, “Reflections on Northern Rock: The Bank-Run that Heralded the Global Financial Crisis,” *Journal of Economic Perspectives* 23 (1) (2009): 101-119.

⁸ M. Brunnermeier and L. H. Pedersen, “Market and Funding Liquidity,” *The Review of Financial Studies* 22 (2008): 2201-2238; S. Morris, and H.-S. Shin, “Liquidity Black Holes,” *Review of Finance* 8 (1) (2004): 1-18; Geneva Reports on the World Economy 11, “The Fundamental Principles of Financial Regulation,” Centre for Economic Policy Research (2009).

A Central Bank as Lender of Last Resort

In such a situation, the only institution capable to satisfy the excess demand for secure and liquid assets, to support the banking sector, and to restore financial stability is the central bank in its role as lender of last resort. Since a central bank can never become insolvent in its own currency due to its monopoly of issuing the legal tender, it is able to mitigate the effects of a banking crisis by providing additional central bank money, thereby preventing the occurrence of the “bad” equilibrium. The LLR function is therefore derived directly from the central bank's monopoly on issuing legal tender and the resulting structural dependency of the banking sector on the central bank.

Banks always need a minimum amount of central bank liquidity in order to conduct their business. Normally, a central bank makes these funds available in sufficient quantities as part of its liquidity management strategy. In times where there is no financial turmoil, it is sufficient to provide only as much central bank liquidity to the commercial banking sector as is required on aggregate. The allocation of available liquidity among the individual banks is then left to the interbank market.⁹

The LLR function of the central bank can therefore be seen as the continuation of its liquidity management strategy during a crisis when the functioning of the financial system's institutions commonly used to implement monetary policy are impaired and there is a risk of individual or systemic liquidity crises. As a result, the transition from a central bank implementing its regular liquidity management strategy to it exercising its function as lender of last resort occurs in line with crisis developments. The most important changes compared to non-crisis times are:

A stronger emphasis in the objective function of the central bank is placed on securing financial stability. The fact that sufficient liquidity is provided to the banking sector to secure financial stability ultimately also serves to secure price stability. What in normal times might cause higher inflation rates becomes crucial to securing price stability during a financial crisis.

Liquidity management becomes less rule-based, but is rather driven by discretionary decisions taken by the central bank.

⁹ See U. Bindseil, *Monetary Policy Implementation – Theory, Past and Present* (London, 2004); for a brief overview, see also M. Fratzscher, P. König, and C. Lambert, “Liquiditätsmanagement des Eurosystems im Zeichen der Krise,” *DIW Wochenbericht*, no. 44 (2013).

Box 1

Emergency Liquidity Assistance (ELA)

Emergency Liquidity Assistance (ELA) is still the European Central Bank's only and most important instrument to provide liquidity for individual banks. The ECB's role as lender of last resort (LLR) is frequently equated with the ELA.¹

In contrast to all other monetary policy operations, the ELA provides central bank liquidity solely through the responsible national central bank.² In principle, these operations are only aimed at illiquid but solvent banks. Only the national central banks, which are also solely liable for the associated risks, decide on the respective terms and conditions (amount, deposited securities, risk premiums, interest) at which the ELA loans are provided; there is no risk-sharing according to the ECB's capital key, as with other monetary policy operations.

The ECB already provides a marginal lending facility as part of its regular liquidity management activities in which banks may receive any desired amount of liquidity overnight, as long as they have the corresponding Central Bank collateral. A bank may normally only obtain ELA loans if it has fully exhausted its collateral pool. Herein lies the main point of criticism of these operations: a bank that has already fully exhausted its Central Bank collateral will most probably not only have a liquidity problem but, in fact, also a solvency problem. The latter would, in turn, fall within the competence of national regulatory authorities and of the fiscal authorities, and not within the remit of national central banks. As a result, the ELA enables a member state to prevaricate on solving a bank's solvency problem by pressing the country's national bank to carry out quasi-fiscal activities. This problem is particularly relevant when the resolution of a bank is associated with high fiscal costs which would put significant strain on the government's budget. Although ELA lending may not contravene the prohibition on monetary financing (Article 123, TFEU), the distinction is far more difficult to determine here than in other cases³ and its misuse for the purposes of monetary financing is very difficult to prove. In addition, the process for granting ELA loans is not transparent. Generally, no bank has an entitlement to such loans. This means that the ECB and/or the national central banks are pursuing the concept of "constructive ambiguity": there

are no explicit criteria as to when and to whom ELA loans are granted. This is intended to prevent any possible moral hazard that might occur if banks ex ante expect to be granted ELA loans and would take more risks as a result.⁴ Nevertheless, most ELA cases are eventually announced, although refusals are not made public. This weakens the approach of constructive ambiguity in preventing moral hazard. Only when rejected requests for ELA loans are in fact transparent can a bank no longer be sure of actually receiving liquidity assistance in times of crisis.

At the same time, applying the concept of constructive ambiguity also undermines its ability to control the expectations of market participants with an explicit commitment to the LLR function. The Central Bank can help ensure that "bad" equilibria never emerge by exploiting the "expectations channel." Market participants would therefore know from the outset that liquidity problems simply cannot occur.

Due to the risk of it being misused for fiscal policy purposes and its accompanying lack of transparency, the ELA facility should therefore be viewed with skepticism. The question as to how effective the approach of constructive ambiguity actually is in preventing potential moral hazard has not yet been sufficiently resolved.

On the other hand, it is completely understandable why the national central banks and the ECB have continued with this practice to the present day.⁵ There is not necessarily a direct link between the stocks of approved Central Bank collateral and the insolvency of a bank. Consequently, the Central Bank retains the option of supporting an illiquid bank despite it having a depleted pool of collateral. But in order to protect third-parties against losses due to ELA loans being incorrectly given to insolvent banks, the risk from awarding these loans remains with the respective national central bank. It therefore follows that the national central bank must also be able to determine appropriate terms and conditions.

¹ For example, C. Goodhart, "Myths about the Lender of Last Resort," *International Finance* 2 (3) (1999): 339-360.

² The Board of Governors of the ECB, with a two-thirds majority, can restrict or prohibit ELA lending above a threshold of two billion euros.

³ The most obvious case of monetary financing would be, for example, the Central Bank purchasing government bonds on the primary market.

⁴ ECB, *Monthly Bulletin: 10th Anniversary of the ECB* (2008), 123.

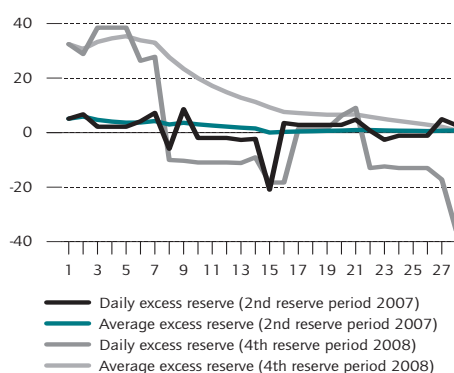
⁵ During the crisis, a number of countries made full use of the ELA including Germany, Ireland, Cyprus, and Greece, see Unicredit Research, "Digging into ELA," *Economic Special* (May 2012), www.research.unicreditgroup.eu/DocsKey/economics_docs_2012_127006.ashx?KEY=C814QI31Ejqlm_1zJDBJDmMnEO6thgFdPjpWWIIVc%3D&EXT=pdf or Morgan Stanley Research, *Emergency Liquidity Provision in the Euro Area* (November 2010), http://estatico.vozpopuli.com/upload/Luis_Rey/emergency-liquidity-assistance.pdf.

Nevertheless, it would now seem urgent to reconsider and restructure the practice of ELA lending in the euro area. First, the provision of ELA-loans should be made more transparent—if this is not immediately possible, granted and refused loan applications should be made public after a slight delay. Second, the ELA should, like all other monetary policy operations, be put under the control of the ECB so it can prevent any potential misuse. This also implies that risks from ELA should be divided in accordance with the ECB's capital key. Third, specific regulations should be stipulated in advance—in particular, approved ELA collateral and its corresponding haircuts. The collateral framework can indeed be broad in scope. Certainly, stipulating regulations in advance would provide better opportunities to prevent cases of insolvency and, at the same time, give banks additional incentives to behave more cautiously.

Figure 1

Excess Reserve Holdings¹ during typical maintenance periods before and during the Crisis

In billions of euros



¹ The excess reserve is the difference between reserve holdings and the minimum reserve.

Sources: European Central Bank; calculations by DIW Berlin.

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During the financial crisis, many banks increased their liquidity reserves beyond the minimum requirement at the beginning of reserve periods.

The central bank's financial risks increase. It grants more loans to banks that have no market access and pose a greater risk of defaulting. In addition, all credit default risks and the correlation between the default risks of borrowers and their deposited securities increases in any case during a systemic crisis. Further, triggered by unconventional monetary policy measures, the central bank includes additional risk factors to its balance sheet.¹⁰

The central bank increasingly replaces the interbank market. Since ailing banks can no longer compensate for their liquidity outflows via the market, they increase their borrowing from the central bank. Conversely, the healthy banks do not on-lend their liquidity inflows and deposit them at the central bank, which thus replaces both supply and demand side of the interbank market.¹¹

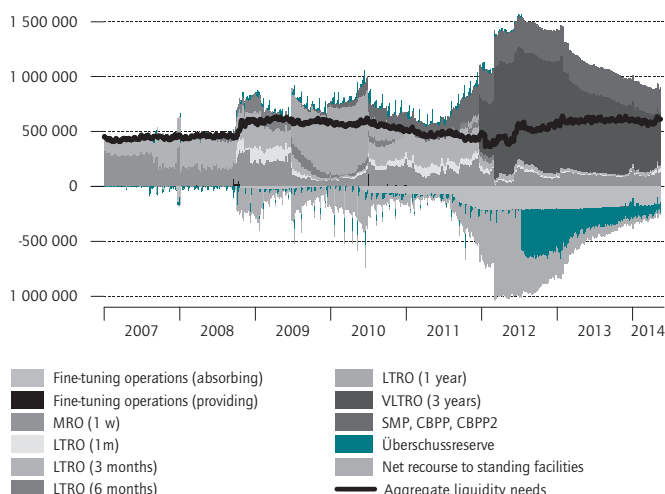
¹⁰ See U. Bindseil and P. König, „Target2 and the European Sovereign Debt Crisis,” *Kredit und Capital* 45 (2) (2004): 135-174.

¹¹ Bindseil and König, „Target2”: 144 ff.

Figure 2

Monetary Policy Operations of the European Central Bank

In billions of euros (liquidity-absorbing operations denoted by a negative sign)



Sources: European Central Bank; calculations by DIW Berlin.

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The ECB has made substantially more liquidity available to the banks, particularly since 2012.

The European Central Bank's Crisis Measures

In principle, LLR measures can be divided into those that the Central Bank makes available to all banks equally and those that deliberately target one particular bank.¹² Measures specifically aimed at individual credit institutions are also frequently made available during non-crisis periods to counter unexpected liquidity problems at individual financial institutions (see Box 1). Like most other central banks, the ECB primarily targeted its measures at the entire banking sector during the crisis.

Summer 2007–Fall 2008

The first phase of the crisis between summer 2007 and fall 2008 was characterized by growing uncertainty on the financial markets and an accompanying increase

in risk premia. To mitigate their exposure to liquidity shocks, banks in the euro area increased their central bank reserves at the beginning of reserve maintenance periods thereby reducing their reserve requirements at the end of a reserve period¹³ (see Figure 1). The ECB accommodated this behavior by raising the provision of central bank liquidity at the beginning of the maintenance periods without, however, increasing aggregate liquidity during the periods. At the beginning of 2008, the ECB also extended the average maturity of its refinancing operations, which further reduced uncertainty about liquidity available in the future.

Fall 2008–Spring 2010

The financial market situation deteriorated with the collapse of US investment bank Lehman Brothers in the fall of 2008; credit risk and liquidity premia dramatically increased and interbank markets around the world collapsed. The ECB countered these developments with a package of measures:

It no longer restricted the amount of liquidity provided: banks have since been able to borrow Central Bank money up to the amount of their available Central Bank securities. By this so-called fixed-rate full-allotment procedure, the ECB assumes the role of a buffer and absorbs shocks which, during normal periods, would be absorbed by the market. The full allotment procedure allows the build-up of considerable excess liquidity.¹⁴ Accordingly, in the course of the crisis, banks also significantly increased their recourse to the ECB deposit facility where they can safely deposit any excess liquidity (see Figure 2).

The ECB extended the average maturity of monetary policy operations by introducing additional transactions with maturities of six months and one year. This reduced banks' uncertainty about liquidity available in the future.

¹³ Banks approved as Eurosystem counterparties must hold a minimum reserve requirement in their Central Bank account over a certain period of time (known as the reserve period). This amount is currently one percent of the reserve base which is largely determined by the institute's deposits; see ECB, "The implementation of monetary policy in the euro area – General documentation on Eurosystem monetary policy instruments and procedures" (2012).

¹⁴ The term "excess liquidity" refers to the difference between the liquidity provided by the central bank and the average liquidity required by banks on aggregate during a reserve period. The latter can be calculated from the balance sheet of the Eurosystem as the difference between aggregate open market transactions and average minimum reserves and net autonomous factors (liquidity changing factors not controlled by monetary policy) of ECB liabilities. This is shown in Figure 2 as an increase in reserve accounts and deposit facilities.

¹² U. Bindseil, "Central bank financial crisis management – a practical perspective with risk management focus," (unpublished manuscript), www.wiwi.uni-frankfurt.de/professoren/wieland/vfs/papers2008/Bindseil.pdf.

The ECB provided euro area banks with foreign currency liquidity as part of cooperative programs with other central banks.

The list of securities that banks can pledge to the ECB as collateral was lengthened significantly. Thereby the ECB lowered the liquidity premia of certain asset classes and increased the potential availability of liquidity (see Figure 3).

Finally, the ECB conducted outright transactions of covered bonds (CBP program) to improve banks' funding conditions in this important segment of the financial market (see Figure 4).¹⁵

At the end of 2009, decreasing tensions on the financial markets led the ECB to slowly reintroduce its standard liquidity management strategy: it no longer provided foreign currency liquidity, it stopped additional longer-term refinancing operations, and it stopped the fixed-rate full-allotment in its regular operations with maturity of three months.

Since Spring 2010

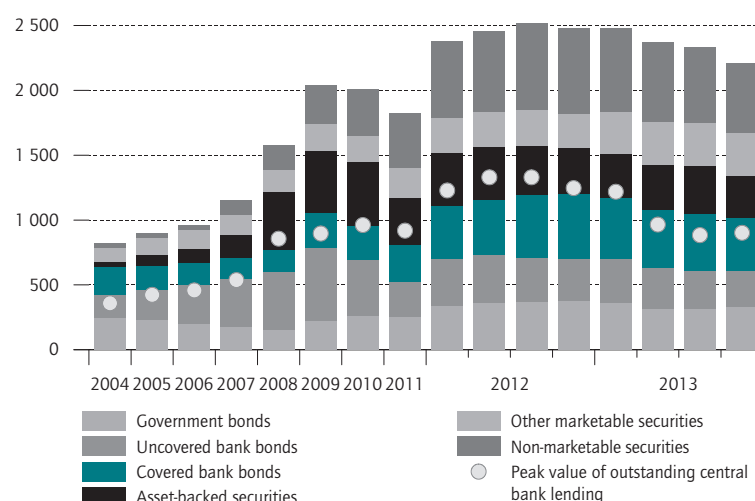
In spring 2010, however, the crisis in the euro area intensified once again and further evolved into a full-blown debt crisis for both the private and public sectors. Sovereign debt and banking problems were mutually reinforcing: the high losses on sovereign bonds as a result of increasing risk premia put pressure on domestic banks because they held large stocks of their own country's sovereign debt; in turn, problems in the banking sector impacted on national budgets, largely due to the generous guarantees provided by the governments. As a result, the financial markets fragmented increasingly along national borders within the euro area. The liquidity provided by the ECB—entirely in keeping with its role as lender of last resort—was increasingly in demand by banks in the crisis countries of Greece, Ireland, Portugal, Spain, Italy, and Cyprus, while the excess liquidity went to banks in Germany, Finland, Luxembourg, and the Netherlands in particular (see Figure 5). In 2010, the ECB postponed any plans to return to its normal liquidity management strategy and introduced further measures:

It again extended the average maturity of its refinancing operations through new transactions with three-, six-, and even 12- and 36-month maturities. The operations with 36-month maturities also had, for the first time, a

Figure 3

Use of collateral by the European Central Bank

In billions of euros



Sources: European Central Bank; calculations by DIW Berlin.

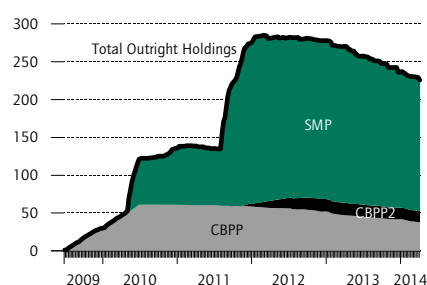
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The ECB has accepted significantly more non-marketable securities since the crisis.

Figure 4

The European Central Bank's Outright Purchase Programs

In billions of euros



Sources: European Central Bank; calculations by DIW Berlin.

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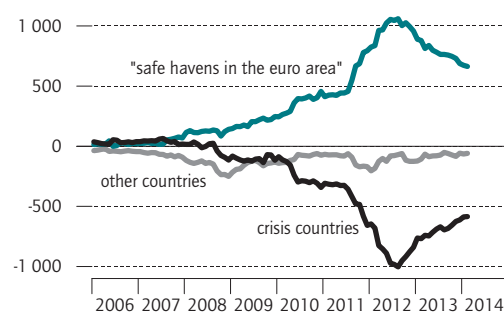
In 2009, the ECB bought covered bonds through the SMP program, then government bonds from 2010.

¹⁵ ECB, "The ECB's response to the financial crisis," Monthly Bulletin (October 2010): 59–74.

Figure 5

Target Balances¹ of National Central Banks

In billions of euros



¹ A negative (positive) target balance reflects net outflows (inflows) of Central Bank liquidity to (from) other countries. The "safe havens in the euro area" are Germany, Luxembourg, the Netherlands, and Finland, the "crisis countries" are Greece, Ireland, Italy, Portugal, Spain, and Cyprus.

Sources: national central banks; calculations by DIW Berlin.

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Since capital from the crisis countries has flowed to the safe havens, the national central banks of the crisis countries accumulated strongly negative target balances, and the safe havens positive ones.

repayment option so that banks could pay back unused liquidity ahead of schedule (see Figure 2).

In addition, the ECB also reintroduced the full allotment procedure in these transactions and explicitly decided to retain it over an extended period of time (currently at least until 2016).¹⁶

Again, the ECB granted cheap dollar liquidity to banks in the euro area via swap lines with the US Federal Reserve.

The ECB bought distressed sovereign debt outright on the secondary market under the umbrella of the newly-designed Securities Market Programme (SMP), thus responding to distortions to the monetary policy transmission channel through excessively high yields on sovereign bonds (see Figure 4).

What's more, it set up a second Covered Bond Purchase Programme (CBPP2) with a volume of up to 40 billion euros. However, due to the low supply of ECB-eligible

covered bonds, the program ended earlier at a volume of only roughly 16 billion euros (see Figure 4).¹⁷

ECB Has Weak Fiscal Support

The crisis measures employed by the ECB in its role as lender of last resort went far beyond the measures it undertakes in non-crisis periods. This raises fundamental questions. What principles should central banks follow in providing LLR support? What should such lending be focused on? And how should the European Central Bank respond to the increasing risks of its measures—i.e., how should it determine hair cuts applied to assets pledged as loan collateralization?

The principles followed by the major central banks in the recent crisis were already largely formulated in the nineteenth century by British economists Henry Thornton and Walter Bagehot.¹⁸ The latter stressed in particular the importance of lending freely in order to prevent a panic—in the case of the ECB, this principle is clearly reflected in the full-allotment procedure and the foreign currency loans it provided.¹⁹

In addition, Bagehot demanded that central bank assistance should be granted only to illiquid but solvent banks.²⁰ In practice, however, it is virtually impossible to clearly distinguish between illiquidity and insolvency, since financial institutions with liquidity problems are usually suspected of being close to insolvency.²¹ According to Bagehot, the central bank could distinguish between the two by providing liquidity only against collateral which is marketable in non-crisis periods. But the problem with this criterion is that an essential part of

¹⁷ See press release from October 31, 2012, www.ecb.europa.eu/press/pr/date/2012/html/pr121031_1.en.html

¹⁸ For a collection of important writings on the LLR, see C. Goodhart and G. Illing, eds., *Financial Crises, Contagion, and the Lender of Last Resort: A Reader* (Oxford University Press, 2002); H. Thornton, *An Enquiry into the Nature and Effects of the Paper Credit of Great Britain* (London: 1802); W. Bagehot, *Lombard Street – A Description of the Money Market* (New York: 1999 [1873]).

¹⁹ Ebd., 196.

²⁰ It is often argued that Bagehot also postulated banks should pay penalty interest in order to prevent moral risks. However, this is only partially correct. Although Bagehot demanded a high interest rate be paid on the additional liquidity, his reasoning was not aimed at preventing moral hazard. Bagehot developed his ideas at the time of the gold standard. Liquidity injections ran the risk of reducing gold coverage, thereby triggering outflows of gold abroad. A high domestic interest rate was able to prevent this "external drain." This is no longer necessary in a fiat money system. Moreover, Bagehot wanted to maintain the market mechanism as much as possible. In particular, he wanted to reduce incentives for excessively hoarding liquidity for prudential reasons. This is not applicable, however, in the event of a systemic crisis resulting in a collapse of the interbank market. Thus, during the crisis, the central banks abstained from charging higher interest rates on additional liquidity injections.

²¹ C. Goodhart, "Myths about the Lender of Last Resort," in Goodhart and Illing, *Financial Crises* (2002).

¹⁶ M. Draghi, Introductory Statement to ECB press conference, November 7, 2013, www.ecb.europa.eu/press/pressconf/2013/html/is131107.en.html.

Box 2

Monetary Versus Fiscal Dominance

Central government bonds are not exposed to any nominal default risk because, in principle, they can be issued in unlimited amounts.¹ As far as the Central Bank is concerned, there is no risk of insolvency. For investors, however, there is a risk of depreciation in real terms if sovereign debt is monetized. If the Central Bank were to act as lender of last resort (LLR), then it would first attempt to reduce the risk of a deflationary spiral triggered by private investors buying up safe assets. There might be a long-term danger of inflation if the Central Bank had insufficient "fiscal support"—if it had no explicit guarantee from the government to accept potential losses and to cover these losses with future budget surpluses. Fiscal support is therefore a prerequisite for securing "monetary dominance," i.e., the primacy of the Central Bank for price stability—despite fiscal risks resulting from its LLR operations. As long as there is no central authority in the euro area with sufficient fiscal sovereignty, any attempt to split the burden-sharing between individual governments will entail huge coordination problems.

In contrast, in a regime of fiscal dominance, the Central Bank will ultimately have to accommodate the fiscal requirements. Nominal debt allows the option of surprise inflation to alleviate negative output shocks without explicitly declaring a sovereign bankruptcy. The real burden of nominal debt is then reduced by a rise in prices. According to the fiscal theory of pricing, a corresponding adjustment of price levels might even prove to be optimal under certain conditions.²

Institutional arrangements introduced in the euro area explicitly intended to preclude a path toward fiscal dominance: the European Central Bank is an independent institution entrusted with the task of ensuring price stability. The prohibition

of monetary financing via the purchase of government bonds by the ECB on the primary market³ should ensure a regime of monetary dominance and therefore prevent governments financing their public finances through money creation.

However, as the Eurosystem was being drawn up, no attempt was made to clearly define rules for ECB fiscal support.⁴ This was based on the naïve monetarist notion that price level and inflation are determined solely by the level and growth of the money supply. However, contemporary monetary theory shows that price stability is not only determined by the money supply, but crucially also by expectations about future government spending. The Central Bank can only take on the role of lender of last resort and implement it efficiently in times of crisis with adequate support and without endangering the long-term objective of price stability.⁵

The lack of explicit fiscal support might be seen as a commitment device to never act as the LLR. Such an arrangement, however, is not credible as a long-term solution to solve the conflict between monetary and fiscal dominance. On the contrary, if the Central Bank acts too cautiously during a crisis, the risk of aggravating the crisis will further escalate and, ultimately, increase the likelihood of an abrupt change toward a regime of fiscal dominance.

¹ See also Box 1 in this article.

² E. Leeper and X. Zhou, "Inflation's Role in Optimal Monetary-Fiscal Policy," NBER Working Paper, no. 19686 (November 2013).

³ Article 123 TFEU.

⁴ Although ECB arrangements stipulate that all gains and losses from monetary policy operations will be divided according to the capital key, they do not, however, clearly outline to what extent a national state has to recapitalize its own central bank and/or the European Central Bank if losses erode capital.

⁵ C. Sims, "Paper Money," *American Economic Review* 103 (2) (2013): 563–584.

banking business requires investment in non-marketable assets. Furthermore, with a diversified portfolio, it is very difficult to decide on a bank's solvency based on the quality of particular assets which constitute only a certain part of the entire portfolio.

Therefore, the securities rather serve to reduce the central bank's financial risk; on the other hand, extending the security framework can also help reduce liquidity

premiums in certain financial market segments, thus stabilizing the financial institutes' financing conditions.

Despite potential risks associated with additional central bank measures, Bagehot's so-called 'inertia principle' provides a minimal response criterion for central bank operations during a crisis: if the central bank makes its collateral standards more stringent during a crisis, to the same extent as private institutions, it would additionally

tighten liquidity, thus aggravating the crisis.²² As a consequence, central banks should at least keep the collateral standards unchanged or even loosen them during periods of financial stress.

The main problem in determining adequate hair-cuts on collateral to reduce the central bank's risk exposure lies with fluctuations in the market prices of risky assets set independently of fundamentally driven fluctuations, for example, in times of panic when banks fire-sell assets, the market price will fall dramatically.²³ If, however, the central bank manages to stop panic selling with support measures, the market price will stabilize on a much higher level. Therefore, risk control measures should not be aligned to the market price during a panic, but to the market price after normalization. Estimates of these prices, however, may prove to be off the mark in hindsight. Even with drastic reductions to the value of the securities, there is still a risk of losses. Paradoxically, if the central bank's risk assessment is too conservative with haircuts on collateral securities being too large, even greater losses may occur as this may prevent a recovery and as a consequence drive the economy into the "bad" equilibrium. If, however, the central bank prevents a systemic crisis by committing to potentially unlimited interventions, then it can actually make profits if it would carry out assets outright purchases during the crisis at undervalued prices.

Nevertheless, one particularly important question is how to deal with any losses resulting from the activities of the central bank as lender of last resort.²⁴ Its capacity to act as such is limited by the maximum loss it can accept. Since, ultimately, the taxpayer must bear any such losses—either in the form of reduced revenues from central bank profits (seigniorage) or in the form of a central bank recapitalization—a clear division of authority between the national treasury and the central bank is vital. Any monetary policy measure eventually has fiscal effects; in order for the central bank to effectively control the price level, the fiscal impact of its measures needs to be addressed with appropriate responses.

Due to their potentially higher risks, LLR activities inevitably cross the line between monetary and fiscal policy. A clear distinction between monetary policy tasks and fiscal risks is only possible if any losses incurred

are covered by democratically legitimized guarantees from the fiscal authorities.²⁵

Fiscal support of this kind is a prerequisite for "monetary dominance"—the ability of a central bank to fulfill its mandate in the long term irrespective of the risks from its activities (see Box 2). This is precisely the point at which the institutional design of the euro area exhibits a weakness. ECB fiscal support is not clearly defined. This would require explicit fiscal coordination among member states, particularly for periods when Maastricht criteria are generally relaxed (e.g., during a crisis). This type of fiscal coordination is not explicitly included in the Monetary Union treaties. Therefore, the independence as set out in the Treaty is more of a complete separation of the ECB and the fiscal authorities of the euro area. A central bank with a clear macroeconomic mandate is in fact only independent if it can take any measure necessary to meet its mandate.²⁶

The absence of such fiscal support is already reflected in the structure of the ECB balance sheet in non-crisis times because it is not part of the budget of an individual member state. The ECB must, therefore, protect itself against shocks that result in capital losses. As a result, its balance sheet usually includes a relatively large share of foreign currency investments, to improve its portfolio diversification and guarantee a minimum value for its monetary base. In contrast, the balance sheet of the US Federal Reserve, for example, offsets banknote circulation and reserve holdings almost exclusively with short-term government bonds. This reflects the fact that any losses are certain to be borne by the US government, although the risk of incurring losses from adverse asset price developments due to its balance sheet structure are virtually negligible.²⁷

Euro Area Susceptible to Self-Fulfilling Crises

The vulnerability of banks to self-fulfilling liquidity problems arises from the specific structure of the banking business. Banks commit to exchange their liabilities for legal tender at face value at any time, but cannot create legal tender themselves. They are therefore de-

²² U. Bindseil, "Central Bank Financial Crisis Management," in U. Bindseil, R. Gonzalez, and Z. Tabakis, *Risk Management for Central Banks and other Public Investors* (Cambridge: 2009).

²³ Brunnermeier and Pedersen, "Market and Funding Liquidity."

²⁴ Although the central bank is at risk of loss from issuing refinancing loans even during normal periods, these are usually very low because the central bank is normally very conservative in terms of its risk-taking.

²⁵ In order to facilitate the smooth implementation of unconventional monetary policy measures, the British Treasury, for example, gave a similar guarantee to the Bank of England at the beginning of 2012.

²⁶ C. Sims, "The Precarious Fiscal Foundations of EMU," *De Economist* 147 (4) (1999): 415–436.

²⁷ C. Sims, "Fiscal Aspects of Central Bank Independence," CESifo Working Paper Series 547 (2001).

Box 3

Risks to the Central Bank from LLR Activities: the Role of Safe Bonds

In almost all monetary systems in modern industrialized countries, bonds with short-term maturities issued by central governments play a key role as safe bonds. In non-crisis times, both the US Federal Reserve and the Bank of England hold almost exclusively central government bonds. These are considered to be completely safe because they are issued in their own currencies and because they are covered by current and future tax revenues from the entire central government. As they can (in principle) be issued in unlimited quantities, they are not exposed to any nominal default risk. In contrast, bonds from individual US states are normally not used for open market operations.

There are, however, no comparable bonds in the euro area. The bonds of individual national governments are deliberately exposed to explicit default risk. The risk premium imposed by financial market should have a disciplining effect and provide incentives for sound budgetary policies. However, the disciplinary and signaling function of market prices is inevitably distorted if contagion effects pose a situation of multiple equilibria. It is very difficult to empirically estimate to what extent observed rises in risk premiums are the consequence of such contagion effects or whether they are, in fact, the result of an intrinsic increase in credit risk. As long as safe bonds are not available from a central government in the euro area, the European Central Bank must make discretionary case-by-case judgments as to whether, and under which haircuts, it is willing to accept the bonds of individual member states as collateral or as outright purchases.

This inevitably affects the disciplining function of market prices. If, for instance, market participants expect the ECB to change the haircuts for bonds from certain states, this

will immediately impact on market interest rates and hence the budget of the respective state. The problem cannot be solved by relying on private market haircuts as benchmark. In the presence of multiple equilibria, there will inevitably be feedback effects because financial market prices also include expectations about the Central Bank's response. A similar problem arises for efforts to impose risk-weighted capital requirements for government bonds in the financial sector. If these requirements ignore potential instabilities emanating from such feedback effects, there is a risk that such risk-weighting does not act to stabilize the European banking system but further aggravates the vicious circle of sovereign debt in individual national states and the debt of their respective financial sectors in times of crisis.

A sensible design for monetary policy would not even intervene in the market for regional government bonds but—similar to the arrangement with the US Federal Reserve (Fed)—would be restricted to the market for safe bonds from the central government. As long as such bonds are not available, collateral, for example, in the form of “synthetic euro bonds” (bonds from a portfolio of all nation states, weighted according to the respective share of GDP in the entire euro area), could assume this function. Their structure alone would generate appropriate incentives for investors in the financial sector to hold a well-diversified portfolio of bonds from the entire euro area. Currently, the lack of safe bonds is hampering the activities of the Central Bank in acting as lender of last resort and is severely restricting its ability to implement unconventional monetary policy measures.

pendent on the central bank to provide them with additional liquidity in a crisis and act as lender of last resort.

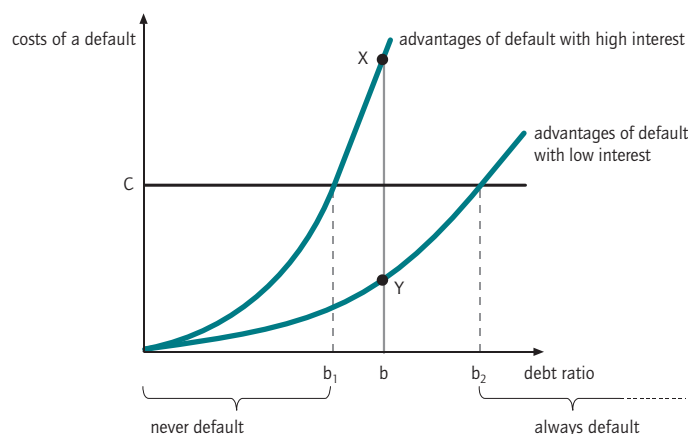
At the same time, sovereign nations indebted in a currency they cannot create on their own are similarly in danger of experiencing a liquidity crisis due to self-fulfilling expectations. Conversely, this danger does not exist for countries indebted in their own currency, the US or UK, for instance. In this case, central government bonds are considered safe bonds because there is no nominal default risk (see Box 3). In the event of a crisis, the government can generate an unlimited amount of the currency in which it is indebted. In contrast, the individual member countries of the euro area are in-

debted in a currency to which those individual governments have deliberately been denied access—their government bonds should be made subject to an explicit default risk.²⁸ In a crisis, investors typically increase their demand for safe assets. This means that they either invest in government bonds of countries that can generate their own currency, or, in the euro area, they re-allocate their funds into bonds of financially buoyant countries that do not require any support measures.

²⁸ C. Sims, “Gaps in the Institutional Structure of the Euro Area,” Banque de France, Financial Stability Review (April 16, 2012): 217–223.

Figure 6

Costs and Benefits of a Sovereign Default



Source: graphic by DIW Berlin, based on P. De Grauwe, "The Governance of a Fragile Eurozone," *Australian Economic Review* 45 (2012): 255–268.

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When interest rates are low, a debt haircut is only "worthwhile" when debt ratios are significantly higher than with high interest rates.

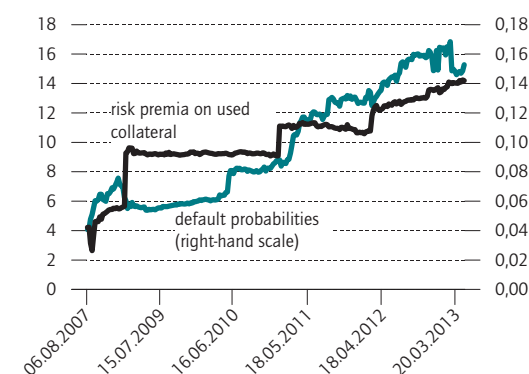
Its specific design makes the euro area vulnerable to contagion effects and self-fulfilling expectations. To illustrate this, suppose that financial markets expect a sovereign borrower to sustainably reduce its debt ratio due to high growth rates. In this case, they only require low risk premia on interest rates. The low interest burden gives the government scope to implement an active growth policy which allows a speedy recovery. Consequently, expectations are self-confirming. On the other hand, however, there is also the risk of a self-fulfilling negative spiral: if a currently high debt ratio triggers fears of a (partial) default, the risk premium on sovereign debt increases, thus further increasing the debt burden. This can lead to a dangerous dynamic in which the solvency of the entire state is endangered. Again, different self-fulfilling equilibria may occur, one of which is clearly worse than the other. With the same fundamental data, either the "good" or the "bad" equilibrium may occur, depending on the expectations prevailing in financial markets. In the latter case, the interest rate cannot fulfill the task of a market clearing price to ensure an efficient allocation of risks.²⁹

²⁹ Empirical evidence for the existence of multiple equilibria in the euro area can be found, inter alia, in M. Gärtner and B. Griesbach, "Rating agencies, self-fulfilling prophecy and multiple equilibria? An empirical model of the European sovereign debt crisis 2009–2011," Working Paper 1215 (University of St. Gallen, School of Economics and Political Science, 2012) or P. De Grauwe and C. Ji, "Self-Fulfilling Crises in the Eurozone. An Empirical Test," CAMA Working Papers 37 (The Australian National University, 2012).

Figure 7

Haircuts and Default Probabilities of ECB Collateral

Average values in percent



Source: ECB, Monthly Report, July 2013.

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While the probability of defaulting on deposited securities increased during the crisis, the ECB reduced risk premiums at the same time.

Inspired by experiences in the debt crisis in Latin America, Guillermo Calvo showed that multiple equilibria can arise if there is uncertainty between the central bank and the fiscal authority over the future path of economic policy.³⁰ Calvo's ideas can be applied to the debt crisis in the euro area. A simple graph illustrates the basic idea (see Figure 6):³¹ line C represents the costs of a sovereign bankruptcy (assumed to be constant). These are incurred when economic activity collapses after a debt moratorium and access to the international capital market is restricted. Conversely, potential benefits of a debt haircut increase with a rising debt ratio: because the government can no longer service its outstanding debt, it can use those resources for other purposes. A debt haircut always occurs when benefits exceed costs.

When interest rates are high, the advantages of sovereign bankruptcy increase rapidly with a rising debt ratio (the curve passes through point X). If interest rates are low, however, the curve only increases slowly (it passes through point Y). This is why a default never occurs whenever debt ratios are sufficiently low. Similarly, whenever debt ratios are sufficiently high, a default always occurs. In the mid-range, for example, with

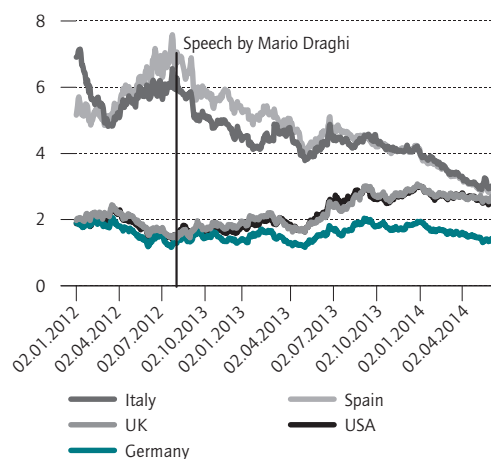
³⁰ G. Calvo, "Servicing the Public Debt: The Role of Expectations," *American Economic Review* 78 (1988): 647–661.

³¹ This graphic from P. De Grauwe, "The Governance of a Fragile Eurozone," *Australian Economic Review* 45 (2012): 255–268.

Figure 8

Government Bond Yields with a Maturity of Ten Years

In percent



Source: Thomson Reuters.

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The announcement by the President of the ECB that he wanted to do everything possible to rescue the euro settled the markets. From then on, Italy and Spain had to pay much less interest.

debt ratio b , two outcomes are possible: if the interest rate is high (point X), a default occurs; but if it remains low (point Y), the debt is serviced. This is a situation of multiple equilibria. The disciplinary function of capital markets fails: instead of offering incentives to rapidly reduce debt, the call for high interest rates leads to a self-fulfilling default.

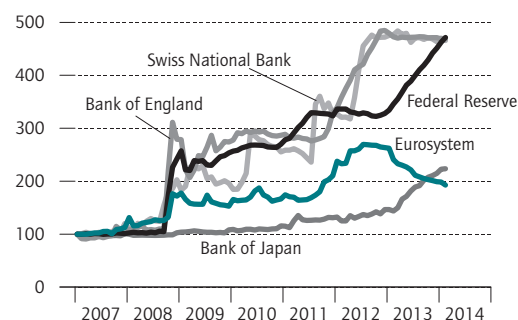
As a consequence, the underlying fundamentals no longer determine the market outcome—rather, which equilibrium will be achieved, depends strongly on expectations of future policy which itself is largely determined by financial markets: the expectations of market participants about the future policy path have a strong influence on which path can ultimately be taken. Changes in sentiment can thus trigger abrupt switches between equilibria. Such events can easily lead to contagion effects between different countries. The occurrence of a “bad” equilibrium in one country may be reflected in the markets participants changing assessments of the situation in a third country.

Empirical studies demonstrate the relevance of such contagion effects. For example, it has been shown that downgrades by rating agencies result in a statistically significant increase in the interest rates of third-party countries which cannot be explained solely by funda-

Figure 9

Expansion of Central Bank Balance Sheets

Index, 2007=100



Sources: European Central Bank; Federal Reserve; Bank of England; Bank of Japan; Swiss National Bank; Thomson Reuters Datastream; calculations by DIW Berlin.

© DIW Berlin

The ECB expanded its balance sheet significantly less during the crisis than other major central banks.

mental factors. In contrast, no evidence of contagion has been found for the case when a country's credit rating has been upgraded.³²

The ECB as Lender of Last Resort for Countries in the Euro Area?

At the outbreak of the crisis, no institutional mechanism was available in the euro area to keep such contagion effects in check. When capital outflows from Greece, Ireland, and Portugal started to affect the much larger economies of Italy and Spain and the fear of a break-up of the entire euro area led to a rapid increase in outflows, neither the fiscal nor the monetary policy authorities had appropriate instruments to reverse the negative spiral of self-fulfilling expectations in financial markets—mainly because it was not clearly defined how the potential burdens would be divided and what conditions would be attached to utilizing such instruments. At that stage, the ECB was the only institution in the euro area able to act quickly enough to take the necessary measures and restore confidence as lender of last resort. However, the effectiveness of the ECB was severely impeded by the lack of fiscal support, which would have absorbed the risks arising from its function as lender of last resort as well as from any bank resolu-

³² See Böninghausen, B. Benjamin, and M. Zabel, “Credit Ratings and Cross-Border Bond Market Spillovers,” LMU Munich Economic Discussion Papers, (2014).

tion. Initially, the ECB's willingness to take appropriate risks was limited, as was the impact of its rescue operations as a whole. This is illustrated, *inter alia*, by the increased haircuts on pledged collateral that accompanied each extension of the collateral framework (see Figure 7). A further example is the fairly limited success of the Securities Markets Programme (the ECB's purchase of government bonds on the secondary market): by announcing that these purchases would be strictly limited and discontinued as soon as possible, it lacked credibility that all would be done needed to prevent the collapse of the Monetary Union. Since the ECB also stated that it would never accept a haircut on its bond portfolio, the loss given default for privately held bonds rose with each purchase. This might have actually reversed the desired effect: Rather than reducing the risk premia on bonds of distressed countries, it resulted instead in a further increase of risk premia. If, in Greece's case, the ECB had accepted a haircut, the taxpayers would have had to cover the corresponding losses. This would have required appropriate fiscal coordination to prevent any inflationary consequences. The ECB obviously did not want to take this risk at the time of the Greek debt restructuring.

Only the Outright Monetary Transactions (OMT) program met the conditions required to avert the threat of a self-fulfilling "bad" equilibrium, when Mario Draghi announced in the summer of 2012 that the ECB is, within its mandate, ready to do whatever it takes to preserve the euro. In addition, the ECB declared that it would also accept *pari passu* status when purchasing sovereign bonds.³³ By doing so, it tried to implicitly secure its "monetary dominance." The OMT was therefore—despite it only being a verbal intervention at the time—very successful in the short term. While it remains debatable to what extent the sharp rise in the interest rate spreads during the crisis was actually due to the risk of a break-up of the euro or due to individual fundamental factors, the fall of interest rates after introduction of the OMT provides a strong indication of its success. If the effect of the OMT program had been confined solely to a redistribution of fundamental risks from the periphery to the core states, the fall in interest rates in the crisis countries should have been accompanied by a corresponding rise in core countries' rates, while, in fact, long-term interest rates for German government bonds, for example, remained significantly lower than those of the US and the UK (see Figure 8). The fall in interest rates therefore suggests that the significant difference in interest rates was predominantly caused by spiraling expectations associated with multiple equilibria.

The rather late introduction of the OMT program during the crisis revealed the structural design flaws of the euro area and the inefficient delays associated with the activities of the European Central Bank as lender of last resort. Its current institutional design reinforced the ECB's tendency to initially act in a reserved and timid manner. This applies more generally to its unwillingness to embrace unconventional monetary policy measures. As a result, the expansion of the Central Bank's balance sheet in the euro area since the outbreak of the financial crisis was much weaker than in other countries affected by the crisis (see Figure 9).

Conclusion

The heated controversy, particularly in Germany, over monetary policy—for example, losses that could be incurred by the European Central Bank ("ECB as a bad bank"³⁴) or the legitimacy of the OMT program—have led many observers to fear that the ECB's power will be called into question again in the future. The European Stability Mechanism (ESM), permanently established in September 2012 by the member states of the European Union, is an important step in preventing this. In the event of a crisis, the ESM may grant financial assistance to defaulting member states in compliance with strict conditionality. To act effectively as lender of last resort for states, however, the ESM would need access to loans from the European Central Bank. In addition, it is imperative that the independence of the ECB in its role as lender of last resort is strengthened by fiscal backing of national parliaments. This is the only way to guarantee fiscal support for its monetary policy operations, comparable with other central banks, along with democratically legitimized enforcement powers. This means that in order to maintain financial stability and consequently price stability the ECB must be able to operate as lender of last resort. However, the Central Bank can only fulfill its mandate if fiscal responses to its measures are forthcoming. Only then can a credible regime of "monetary dominance" be established in which a truly independent Central Bank can meet its mandate of price stability.

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JEL: E52, E58, G21, F36

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³³ See ECB, press release, September 6, 2012.

³⁴ M. Brendel and C. Pauly, "ECB: Zweifelhaft Werte," *Der Spiegel* 23 (2011), available online at www.spiegel.de/spiegel/a-766905.html.

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