

Eligible Central Bank Collateral in Times of Serious Financial Distress¹

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Executive Summary

- On 15 October the ECB massively expanded the set of securities that it accepts as collateral.
- All securities should be accepted as collateral, given severe enough valuations and haircuts.
- The ECB should be more transparent in explaining how it values illiquid securities as collateral.
- The ECB could use a reverse auction to value securities but it should avoid outcomes with fire sale prices.
- Crisis conditions mean that the Eurosystem could need recapitalisation; an automatic arrangement to provide this should be in place.

The two main roles of a central bank in a modern society are to provide a stable means of payment and to ensure the smooth functioning of financial markets. The second role requires supporting the infrastructure of financial markets, by providing or regulating a payments system, and by ensuring that the main markets remain liquid. In this briefing paper I focus the ECB's performance on this latter task during the recent financial turmoil.

What has the ECB's recent strategy been?

On 4 September 2008, the Eurosystem reported on its biennial review of the risk control measures in Eurosystem credit operations. The press release conveyed satisfaction with the status quo, remarking that the Eurosystem's acceptance of a wide range of collateral contributes to the resilience of euro area financial markets. Some small changes were announced: minor restrictions on the eligible collateral for Eurosystem repurchase agreements ('repos')² and for discount window

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² A repo is an agreement where the borrower sells a security to a lender and simultaneously agrees to buy the security back at a fixed price at a given later date. Thus, it is equivalent to a loan where the security is used as collateral.

('marginal lending facility') borrowing³; slight technical refinements to prevent abuses of the collateral system.

Real change waited until 15 October, when the Governing Council of the ECB announced massive changes in what is to constitute eligible collateral, effective until the end of 2009.⁴ Marketable debt instruments issued in the euro area, but denominated in dollars, pounds and yen, are now eligible subject to a uniform additional haircut of eight percent.⁵ Euro-denominated securities issued in the United Kingdom are eligible, as well. Most importantly, Eurosystem will lower the credit threshold for marketable and non-marketable assets from A- to BBB-, with the exception of asset-backed securities. An additional haircut of five percent will be added to all BBB- securities. The exclusion of asset-backed securities makes sense. Retail-mortgage-backed securities rated AAA often trade at less than 50 cents on the euro; retail-mortgage-backed securities rated BBB- are effectively worthless.

What should be accepted as 'adequate collateral'? Are the Eurosystem's valuations appropriate?

If the Eurosystem is properly capitalised and capable of taking credit risk (default risk) on its balance sheet, in principle any collateral is 'adequate collateral', as long as it is appropriately valued and subject to proper haircuts on this valuation. If the Eurosystem valuation of the securities offered as collateral discounts them aggressively enough and if it applies additional liquidity haircuts on top of these aggressive valuations, there will be no ex-ante subsidy of the borrowing banks by the Eurosystem: the risk-adjusted expected return to the Eurosystem on its lending equals or exceeds the risk-free rate.

Are the Eurosystem's valuations and haircuts sufficiently aggressive? The ECB publishes the haircuts applied to different types of securities offered as collateral. For marketable securities the valuation is the most representative price on the business day preceding the valuation date. But, if the obtained reference price is more than five days old, has not traded in five days or if the security is not marketable, the Eurosystem defines a 'theoretical price'. Unfortunately, the ECB does not publish the models, techniques or practices that it uses for determining this theoretical price. It also does not publish (even with a lag to take care of commercial confidentiality issues) the actual theoretical prices that it assigns to the securities that it accepts as collateral for which there is no readily observable market price. As a consequence, proper financial accountability of the ECB is impossible. In addition, concerns have been expressed that different national central banks (NCBs) in the Eurosystem have not used uniform methods for valuing illiquid

³ The marginal lending facility allows eligible counterparties to obtain overnight loans from the national central banks against eligible collateral. The interest rate is 50 basis points above the interest rate in the ECB's main refinancing (that is, liquidity-providing) operations.

⁴ A minor technical amendment followed on 12 November.

⁵ If a security worth \$1 million has a haircut of ten percent, then it can be used as collateral for a loan of \$1 million minus ten percent of \$1 million, or \$900,000.

collateral. Spain is a country often mentioned in this context. This issue cannot be cleared up if the information on pricing methods and actual prices is not in the public domain.

The ECB is not alone in its opaque behaviour. Responding to the US House Financial Services Committee, Federal Reserve Chairman Ben Bernanke said, 'Some have asked us to reveal the names of the banks that are borrowing, how much they are borrowing, what collateral they are posting.' He commented that the Federal Reserve believed that this would stigmatise banks and be counterproductive. Rather paternalistically he summarised, 'We take collateral, we haircut it, it is a short-term loan, it is very safe, we have never lost a penny in these various lending programs.' On 7 November, Bloomberg News filed a lawsuit under the U.S. Freedom of Information Act to force disclosure of the Federal Reserve's lending.⁶

How should the ECB value collateral?

In deciding how to value the assets that they sell, Treasuries often use auctions; auctions also seem to be an appealing way to value illiquid assets that the ECB holds as collateral. In his Congressional Testimony on the 2008 proposed legislative package to use federal funds to buy toxic assets from troubled firms, Ben Bernanke suggested that a reverse auction should be used to value illiquid assets. A typical auction involves competitive bidding among buyers with the intention of driving up the price; a reverse auction involves competitive bidding among sellers with the intention of driving down the price. Reverse auctions come in many forms: one can start with a high price and lower the price until only the required amount of the security is offered or one can start at a low price and then raise it until just enough of the security is offered. Bids can be sealed or sellers can openly compete. Economists can design reverse auctions so that the buyer pays something close to the reservation offer of the seller. This will reduce the possibility of investment losses for the Eurosystem and, ultimately, euro area tax payers.

It is possible to go too far, however and care must be taken that the resulting price is not too low. If the auction is too successful, it may further stress troubled financial institutions. To see this, recall that the reason that there is no price is that the markets for many asset-backed securities have almost completely frozen. Dysfunctional markets can occur in the presence of asymmetric information, but it is doubtful that one institution knows more than another about the value of the underlying securities in a particular asset-backed security. It is probable instead that the markets have frozen because the sellers do not want a market price revealed. To see this, consider a stylised numerical example of a financial institution. Like most financial institutions, this one is highly leveraged: it has liabilities equal to 30 and equity equal to 1. It has good quality, but mostly illiquid, assets of 25. It also has a particular type of asset-backed securities that it values at 6. It believes that the true value of these securities is about 5. It might like to sell some of these securities to increase its liquidity, but if it

⁶ Reported in Matthews, Steve and Craig Torres, 'Bernanke Says Federal Reserve Won't Reveal Details on Loans,' Bloomberg, 18 Nov. 2008.

realised a price of 5 it would have to value all of these securities at 5. Because it is highly leveraged, a small change in the price of the securities can leave it perilously close to bankruptcy. If the government were to hold an auction that were overly successful and established a fire sale price of, say, 4 for these securities and the financial institution were required to value its holdings of these assets at 4 then it would be insolvent.

A criticism of using auctions is that some of the securities are too idiosyncratic for an auction. In this case, the ECB would face a similar trade-off: the haircut applied should be sufficiently severe as to discourage abuse but not so severe as to make legally bankrupt institutions that might not otherwise be insolvent.

What is the effect on the balance sheets of the ECB and the Eurosystem of accepting a wider range of collateral?

The ECB does not do repos or discount window operations. This is operationally decentralised through the NCBs. This explains why the ECB has a tiny balance sheet and the Eurosystem has a huge balance sheet. All losses incurred in the context of normal monetary policy and liquidity operations by any of the NCBs are shared throughout the Eurosystem on the basis of their shareholdings in the ECB.⁷

Under crisis conditions, the provision of adequate liquidity inevitably exposes the Eurosystem to capital losses and capital inadequacy. In the worst case, it could fail unless the ECB prevented bankruptcy through money creation and thereby jeopardised its inflation mandate. Currently, there appears to be no agreement on how, or even if, the Eurosystem should be recapitalised. This is not a trivial political problem as some countries banks are more exposed than others. However, the absence of an agreement on the automatic recapitalisation of the Eurosystem according to some clear and unambiguous fiscal sharing rule is scandalous and could undermine the effectiveness of the ECB just when it is most needed.

A mechanism that the Eurosystem might use is to have the Eurosystem swap any collateral that receives that is not effectively free of default risk for euro area government securities. These euro area government securities would be supplied on demand to the Eurosystem by a Special Purpose Vehicle created and owned by the euro area national governments. This vehicle would acquire toxic collateral, at the valuations established by the ECB, by issuing debt guaranteed jointly by the euro area national governments. All central banks need clear, unambiguous and instantaneous fiscal backing and indemnification for losses along these lines or through substantially equivalent mechanisms. The absence of a clear fiscal backup mechanism for the Eurosystem for losses incurred as a result of its monetary and liquidity operations is a major systemic weakness.

⁷ The ECB is owned by all 27 EU central banks, not just by the 15 euro zone NCBs. The relevant shares are therefore scaled by the share of the 15 euro area NCBs in the total capital of the ECB

There is less of a problem when NCBs provide financial support to troubled financial institutions in their jurisdiction. Under the Treaty, this is only permitted if the associated government agrees to compensate the central bank for any losses that are incurred. If this were not the case, the NCB would be making a direct loan to the government, which is against the Treaty. Complications exist, however, when a troubled bank does not have a clear nationality, as was the case with Fortis, which was partially nationalised on 28 September with the governments of the three Benelux countries purchasing shares, and Dexia, which was partially nationalised on 30 September with the Belgian, French and Luxembourg governments all acquiring an interest. Unfortunately, such shining examples of ad-hoc cross-country cooperation cannot be relied upon. There needs to be a clear formal sharing rule for bail outs of cross-border banks. As increasing numbers of financial institutions register as a *Societas Europaea* (that is, as a European public company) under the Council Regulation on the Statute for a European Company, adopted in October 2001, the problem will become more acute.

Are the present liquidity injections by the ECB effective?

The ECB's collateral policy and liquidity injections have not restored the operation of the wholesale financial markets. This is not surprising. When Lehman Brothers filled for Chapter 11 bankruptcy protection on 15 September 2008 – the largest bankruptcy in US history – what many believed to be a liquidity crisis was revealed to be an insolvency crisis of epic proportions.

Even after immense capital injections by national governments, intended to get the banks to resume lending, the Euribor-OIS spreads indicate that there remains massive default risk fear or illiquidity fear among banks.⁸ Markets for unsecured lending have ground to a halt.

Such extreme dysfunction in credit markets can be explained by adverse selection. To see this consider the following highly stylized numerical example. Suppose financial institutions – call them “banks” – each want to borrow the same amount from financial institutions that have funds to loan. Half of the banks are in good shape; they are willing to pay 7 percent and always repay their loan. The other half of the banks are in bad shape; they are willing to pay 14 percent, but default with probability 1/2.⁹ All banks can post collateral equal to the value of the loan, so that if the loan cannot be repaid the lenders receive their principle, but no interest. Lenders require an expected return of six percent to be willing to make a loan.

If there were no informational problems, then the credit market is fully liquid. Lenders are willing to lend to the safe banks at an interest rate of at least 6 percent and the safe banks are willing to borrow at an interest rate of no more than 7 percent. Thus,

⁸ Euribor-OIS spreads are an important indication of illiquidity and risk in euro area money markets.

⁹ A story might be that the bad banks must make a risky, but high-return, investment to survive.

the safe banks will get a loan at some rate between 6 and 7 percent. Lenders get an expected return of six percent by lending to risky banks at 12 percent and the risky banks are willing to borrow at rates up to 14 percent. Thus, the risky banks will get a loan at some rate between 12 and 14 percent.

Suppose, however, that there is asymmetric information: a bank's type is known only to the bank. If lenders lend to all banks, the probability that any bank repays is $\frac{3}{4}$ and the interest rate must be at least 8 percent to get an expected return of 6 percent. Safe banks will not borrow at 8 percent; thus, the only banks that will borrow are risky banks. Lenders set the interest rate between 12 and 14 percent and only risky banks accept loans.

Note that in normal times, this adverse selection problem is not terribly important. Suppose $\frac{19}{20}$ of all banks are safe and $\frac{1}{20}$ of all banks are risky. Then, with asymmetric information, the probability that any bank repays is $\frac{39}{40}$ and lenders only need to charge about 6.15 percent to get an expected return of 6 percent. All banks get loans. In turbulent times, with many different qualities of banks, however, the problem can become severe, resulting in high interest rates and a drastic reduction in lending. To see this, suppose that there are five types of banks, each type making up 20 percent of the bank population. The table below gives the maximum interest rate a type- i bank will pay, R_i , the probability that a type- i bank will repay its loan, P_i , and the minimum interest rate r_i at which lenders would be willing to lend to the type- i bank if there were complete information.

Table 1. Adverse Selection Example

Type	1	2	3	4	5
R_i	7	8.5	9.5	11	14
P_i	1	$\frac{6}{7}$	$\frac{5}{7}$	$\frac{4}{7}$	$\frac{3}{7}$
r_i	6	7	8.4	10.5	14

As can be seen from the table, with complete information, each bank would receive a loan. Suppose that there is asymmetric information, however. If all banks are to receive a loan then, the probability a bank repays is $\frac{5}{7}$ and the interest rate must be 8.4 percent for the lenders to make an expected return of 6 percent. But, if the interest rate is as high as 8.4 percent, type 1 banks will not borrow: they exit the market. This causes the probability of repayment to drop to $\frac{9}{14}$ and the lenders must charge an interest rate of about 9.3 percent. This causes type 2 borrowers to exit the market and the repayment probability drops to $\frac{4}{7}$. The lenders must charge an interest rate of 10.5 percent and the type 3 borrowers exit the market. The repayment rate drops to $\frac{1}{2}$ and the lenders must charge 12 percent. This causes the type 4 borrowers to exit the market. Only type-5 borrowers get loans, paying 14

percent. In examples where the number of types becomes large, the market can nearly vanish altogether.¹⁰

Governments can improve the situation by getting the banks to pool. It can do this in two ways. First, they could offer to guarantee unsecured interbank lending, independently (as do the Dutch and Irish governments) or jointly. In the former scenario, it is important that cross-border transactions be insured as well as domestic ones. Alternatively, they could set up an arrangement whereby the Eurosystem acts as universal counterparty in interbank lending at a range of maturities, probably up to 1 year.

What is the likely long-term effect of the current turmoil on central banking in the euro area?

The central bank will be given a significant regulatory and supervisory role. There will have to be a formal resolution of the problem of capital depletion of the ECB/Eurosystem. A vehicle with an open-ended and uncapped capacity to swap risky collateral acquired by the ECB in its monetary and liquidity operations for euro area sovereign debt is a possibility. A euro area fiscal facility, administered by the European Commission, with the ability to tax and issue its own debt may have to be considered.

¹⁰ This type of “market for ‘lemons’” story is due to Akerlof (1970).