

CENTRAL BANK MONITORING – DECEMBER

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In this issue

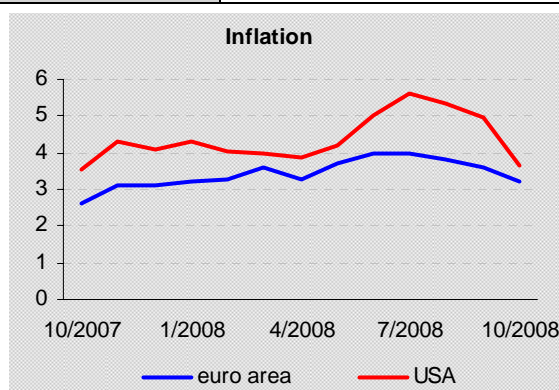
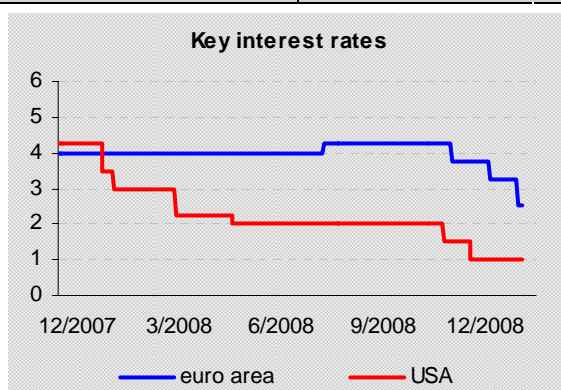
The past three months have seen an escalation of the financial crisis. Several major financial institutions have collapsed and the global financial system has been shaken to its foundations. The crisis is hitting more and more countries and central banks. This issue, therefore, is devoted mostly to the financial crisis. Central banks in all the countries under review except Hungary took individual and coordinated action to ease monetary policy as the crisis escalated, responding to concerns of a sharp deterioration in economic growth and to falling inflation. In Spotlight we tell the entire tale of the financial crisis from its initial causes to the present time. Our selected speech is Lars Nyberg’s address on the challenges to be faced following the current crisis.

1. Latest monetary policy developments at selected central banks

ECB and Fed

	<u>Euro area (ECB)</u>	<u>USA (Fed)</u>
<i>Inflation target</i>	< 2% ¹	n.a.
<i>MP meetings (rate changes)</i>	2 Oct (0.00) 8 Oct (-0.50) C 6 Nov (-0.50) 4 Dec (-0.75)	16 Sep (0.00) 29 Sep (0.00) E 8 Oct (-0.50) C 28–29 Oct (-0.50)
<i>Current basic rate</i>	2.50%	1.00%
<i>Latest inflation</i>	2.1% (Nov 2008) ²	3.7% (Oct 2008)
<i>Expected MP meetings</i>	15 Jan 5 Feb 5 Mar	15–16 Dec 27–28 Jan
<i>Other expected events</i>	5 Mar: publication of forecast	14 Jan: publication of Beige Book
<i>Expected rate movements³</i>	↓	↓

• The **ECB** cut its key rate by 1.75 p.p. to 2.50% during the quarter, once at an extraordinary meeting (8 Oct) at which it agreed jointly with banks of the G10 nations (the Fed, the Bank of Canada, the BoE, the Riksbank and the Swiss National Bank) to take coordinated action to *(continued below charts)*

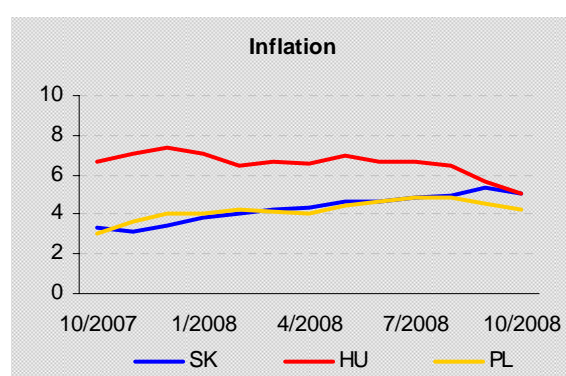
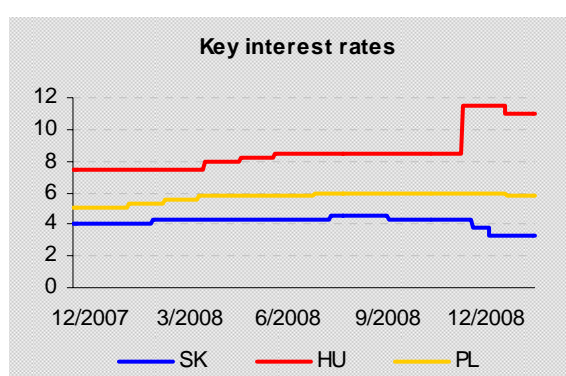


¹ ECB definition of price stability; ² preliminary estimate; ³ direction of expected change in rates in coming quarter taken from Consensus Forecasts survey; C denotes coordinated monetary policy decision; E denotes extraordinary meeting

ease monetary policy by reducing key rates by 0.50 p.p. This measure was justified by a moderation of inflationary pressures due to declining commodity prices and worsening economic growth prospects caused by the significant intensification of the financial crisis. The ECB’s second rate cut of 0.50 p.p. at the start of November was communicated in a similar vein against the background of a broadly stable price outlook and a then declining rate of inflation. The new, more intense phase of the financial crisis was ushering in a greater-than-expected dampening of euro area and global demand, and it was to the sharp slowdown in economic activity that the ECB responded by cutting rates significantly in December as well. The **Fed** lowered its key rate twice in a row, by 0.50 p.p. to 1%. The first reduction was part of the coordinated action taken by the banks of G10 nations. The second monetary policy easing came in response to a continuing rapidly deteriorating outlook for economic activity.

Central European economies

	<u>Slovakia (NBS)</u>	<u>Hungary (MNB)</u>	<u>Poland (NBP)</u>
<i>Inflation target</i>	<2%	3.0%	2.5%
<i>MP meetings (rate changes)</i>	30 Sep (0.00) ⁴ 28 Oct (-0.50) 11 Nov (-0.50) E 25 Nov (0.00)	29 Sep (0.00) 20 Oct (0.00) 22 Oct (+3.00) E 24 Nov (-0.50)	23–24 Sep (0.00) 28–29 Oct (0.00) 25–26 Nov (-0.25)
<i>Current basic rate</i>	3.25%	11.00%	5.75%
<i>Latest inflation</i>	5.1% (Oct 2008)	5.1% (Oct 2008)	4.2% (Oct 2008)
<i>Expected MP meetings</i>	19 Dec	21 Jan 25 Feb	27–28 Jan 24–25 Feb
<i>Other expected events</i>		25 Feb: publication of IR ⁵	2nd half of Feb: publication of IR ⁵
<i>Expected rate movements³</i>	↓	↓	→



⁴ The NBS decides on rates once a week; the dates given correspond to the expected dates of discussion of the Situation Report; ⁵ Inflation Report; E denotes extraordinary monetary policy meetings

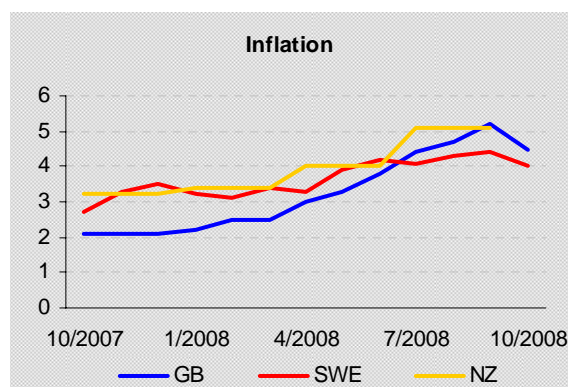
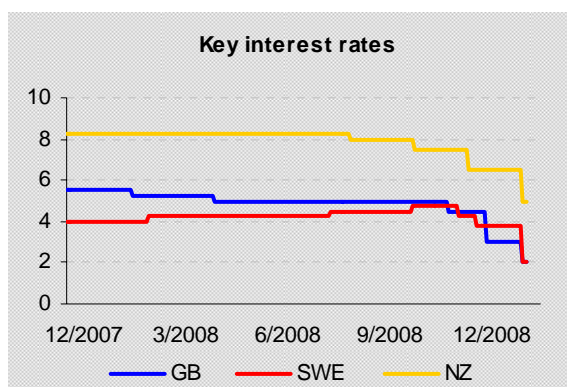
The **NBP** reduced its key rate by 0.25 p.p. to 5.75% in reaction to a deteriorating outlook for the domestic economy, due primarily to slowing economic activity in the USA, the euro area and the UK and to declining food and commodity prices. In its decision the NBP also took account of the deepening financial crisis and the related rise in refinancing costs and worsening credit availability.

The **NBS** followed the rate cut in the euro area, lowering its rates by 1 p.p. to the ECB level of 3.25% owing to the need to synchronise the Slovak financial environment with the euro area. Slovakia is to enter the euro area at the start of next year, so this is the final issue of *Monitoring* covering Slovakia separately.

The **MNB** raised its interest rates by a full 3 p.p. in October in response to an unexpected sudden depreciation of the forint ([at the time of the MNB's intervention the forint was at a historical low against the euro](#)). The MNB left its key rate unchanged at its regular meeting on 20 October, but implemented an extraordinary increase two days later in the light of growing adverse conditions in the foreign exchange market. For the Hungarian economy, the strong depreciation of its currency means among other things higher refinancing costs for external debt and foreign currency loans. These problems will in all probability lead to a recession in Hungary. The extraordinary interest rate hike was partially adjusted at the November meeting, when the MNB lowered its rates by 0.50 p.p. in response to a calming of the foreign exchange market situation and a fall in the expected rates of inflation and economic growth due to the crisis in the Hungarian economy.

Other selected inflation-targeting countries

	<u>United Kingdom (BoE)</u>	<u>Sweden (Riksbank)</u>	<u>New Zealand (RBNZ)</u>
<i>Inflation target</i>	2%	2%	2%
<i>MP meetings (rate changes)</i>	8–9 Oct (-0.50) C 5–6 Nov (-1.50) 3–4 Dec (-1.00)	8 Oct (-0.50) C 23 Oct (-0.50) 3 Dec (-1.75)	11 Sep (-0.50) 23 Oct (-1.00) 4 Dec (-1.50)
<i>Current basic rate</i>	2.00%	2.00%	5.00%
<i>Latest inflation</i>	4.5% (Oct 2008)	4.0% (Oct 2008)	5.1% (2008 Q3)
<i>Expected MP meetings</i>	7–8 Jan 4–5 Feb 4–5 Mar	10 Feb	29 Jan
<i>Other expected events</i>	11 Feb: publication of IR ⁵	11 Feb: publication of Monetary Policy Report	
<i>Expected rate movements³</i>	→	→	→



The **BoE** lowered its key interest rate three times in a row, the first time by 0.50 p.p. in the coordinated reduction by central banks, the second time by 1.50 p.p., and the third time in December by 1.00 p.p. to 2%. The second and third sizeable cuts came in reaction to a substantial downward shift in the prospects for inflation resulting from a deterioration in the outlook for economic growth at home and abroad coupled with a fall in commodity prices. According to the November *Inflation Report*, there was a risk of inflation undershooting the inflation target in the medium term. Moreover, the UK banking system experienced strong shocks in the past quarter, when the BoE and the government intervened with strong measures to restore stability in the sector (see *Spotlight*).

The **RBNZ** lowered its key rate three times in a row, by 0.50 p.p., 1.00 p.p. and 1.50 p.p. to 5.00%, owing to a sizeable deterioration in the outlook for domestic economic growth. The decisions were shaped by the ongoing financial crisis (less readily available credit) and the marked deterioration in the outlook for global growth. The RBNZ said that the cumulative reduction in rates had taken monetary policy to an expansionary position and should keep inflation from falling below the target band.

The **Riksbank** also reduced interest rates three times in a row – twice by 0.50 p.p. and in early December by 1.75 p.p. to 2%. The large December cut was a reaction to an unexpectedly rapid deterioration in economic activity. By reducing its key rate, the Riksbank wants to dampen the impact of the financial crisis on the real economy and keep inflation near the inflation target of 2%.

2. News

Coordinated interest rate cuts by G10 central banks

The Bank of Canada (BoC), the Bank of England (BoE), the European Central Bank (ECB), the Federal Reserve (Fed), Sveriges Riksbank and the Swiss National Bank (SNB), supported by the Bank of Japan (BoJ), took coordinated action to ease the monetary conditions by reducing interest rates by 0.50 p.p. on 8 October 2008.

Coordinated provision of dollar liquidity

Central banks (the Fed, the BoE, the BoC, the ECB, the BoJ and the SNB) on 7 October 2008 announced a coordinated increase in the number of dollar auctions. Two 28-day and 84-day term auctions, to be held before the year-end, were tentatively announced. A [week later](#) further dollar auctions were announced, this time 7-day auctions conducted by the ECB, the BoE and the SNB at fixed interest rates for full allotment. These operations are tied to swap lines with the Fed.

ECB changes tender procedure

The tender procedure for the main refinancing operations was previously carried out through a variable rate tender procedure (minimum bid rate). Effective 15 October 2008, these operations are carried out with full allotment at a fixed rate equal to the ECB's key rate (currently 3.75%).

Fed creates new Term Asset-Backed Securities Loan Facility (TALF)...

On 25 November, the Fed announced the creation of a new facility to help market participants meet the credit needs of households and small businesses. The facility will support the issuance of asset-backed securities collateralised, for example, by student loans, auto loans and credit card loans.

...increases interest paid on reserves...

The Fed on 5 November announced that it would alter the formulas used to determine the interest rates paid to depository institutions on required reserve balances and excess reserve balances. The Fed will no longer deduct 10 b.p. and 35 b.p. respectively from these two rates, which are derived from the Fed's target federal funds rate, thus increasing the reserve remuneration. With this measure the Fed is trying to foster trading in the funds market at rates closer to its key rate.

...announces creation of Money Market Investor Funding Facility (MMIFF)...

On 21 October, the Fed announced the creation of a facility to support money market investors. The facility is designed to provide liquidity to such investors. It is essentially a Fed credit facility designed for special purpose vehicles created by private-sector companies (see *Spotlight*). The MMIFF complements the previously announced [Commercial Paper Funding Facility](#) (CPFF) and [Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility](#) (AMLF). These facilities are all intended to increase the availability of short-term credit.

...provides more countries with swap lines...

The Fed increased its reciprocal currency arrangement (swap line) with the [Bank of Japan](#) and later established a new \$15 billion swap line with the [RBNZ](#) as well as swap lines of \$30 billion each with the central banks of [Brazil](#), [Mexico](#), [South Korea](#) and [Singapore](#).

...and buys obligations related to mortgages and MBS

The Fed announced purchases of up to \$100 billion in obligations related to mortgages owned by government-sponsored enterprises (Fannie Mae, Freddie Mac and the Federal Home Loan Banks) and purchases of up to \$500 billion in mortgage-backed securities (MBS) backed by Fannie Mae, Freddie Mac and Ginnie Mae.

Financial support to largest U.S. insurer AIG

The Fed and the U.S. government on 10 October announced further measures to support the financial soundness of insurance company AIG. The measures were intended to strengthen AIG's capital structure, resolve liquidity issues, facilitate execution of the plan to restructure AIG and promote

market stability.

Bankruptcy of Lehman Brothers

On 15 September 2008, investment bank Lehman Brothers went bankrupt. The institution had total assets of more than \$600 billion and its bankruptcy is regarded as the moment when the crisis, which until that point had been regarded primarily as a localised liquidity crisis, turned into a global financial crisis. The U.S. government authorities decided not to enter the fray and not to finance Lehman Brothers. After this event, interbank market rates rose even higher on concerns of increased counterparty risk.

NBP and ECB agree on liquidity provision

On 6 November 2008, the NBP and the ECB agreed on the provision of support to the NBP in the form of a facility to borrow up to €10 billion. The agreement relates to repurchase transactions.

MNB introduces O/N currency swap...

In response to the adverse development of the forint, the Hungarian central bank on 16 October 2008 introduced an overnight forint-euro currency swap facility to provide forint and euro liquidity. The swap facility was introduced after the MNB and the ECB signed an agreement allowing the MNB to borrow up to €10 billion from the ECB.

...and lowers reserve ratio...

The MNB lowered its reserve ratio from 5% to 2% to support the liquidity of credit institutions.

...and Hungary gets loan from IMF, WB and EU

Hungary obtained a 17-month stand-by arrangement of \$15.7 billion (SDR 10.5 billion) from the IMF. The IMF loan is conditional on the implementation of budget stabilisation measures and on banking system stabilisation. Hungary obtained additional financing from the EU (\$8.1 billion) and the World Bank (\$1.3 billion) and will thus receive a total of \$25.1 billion, the largest loan provided to a single country since the start of the financial crisis.

Riksbank holds series of USD and SEK auctions

Sweden's Riksbank has in the past few months announced several liquidity-providing USD and SEK auctions and intends to continue doing so in line with the needs of the Swedish economy. The kronor term auctions have been increased in volume and are also being held with 6-month maturity. An overview of the Riksbank's measures can be found here.

Bank of England decides to change terms of Special Liquidity Scheme...

The BoE extended the drawdown period for its Special Liquidity Scheme, under which banks can swap selected mortgage-backed assets for UK Treasury Bills, to 30 January 2009. It also increased the total volume of the scheme to £200 billion from the originally proposed £50 billion.

...and issues documentation on actions of BoE, govt and Financial Services Authority...

...and BoE Governor Mervin King sends letter to Chancellor

As the inflation rate in the 12 months to August 2008 was 4.7% (inflation target: 2%), the BoE Governor sent a letter to the Chancellor of the Exchequer as required by law. In the letter, the Governor explains why inflation was well above the target. In particular, he emphasises increases in the prices of food, oil, gas and electricity and rises in import prices caused by the depreciation of sterling.

Iceland's banking sector collapses...

Iceland's third-largest bank Glitnir was put into receivership on 9 October. The number-two bank Landsbanki was taken over by the state. The largest Icelandic bank Kaupthing was forced to accept a loan from Sweden and sell its Swedish banking business.

[...and the Central Bank of Iceland on 15 October lowered its policy rate by 3.5 p.p. to 12%](#) and then on 28 October, after a meeting with international institutions and owing to the turbulence of the [Icelandic krona](#), raised it by 6 p.p. [to 18%](#). In addition, the bank responded to the dramatic development of the krona by issuing [rules for investing in foreign currencies](#). The rules are aimed at preventing capital outflows from the country.

IMF lends to Ukraine and Iceland

The IMF [supported the Ukrainian economy by providing a two-year stand-by arrangement](#) of \$16.4 billion (SDR 11 billion). Likewise, the [Icelandic economy received two-year financial support](#) of \$2.1 billion (SDR 1.4 billion) to restore confidence in the krona, stabilise the banking sector and ensure medium-term fiscal sustainability.

3. Spotlight: The financial crisis – causes and consequences

For the third time since last September, Spotlight examines the global financial crisis. This time we set out to provide a comprehensive view of the context, causes, course and implications of the crisis, including the subsequent responses by economic policy authorities. The whole tale began with over-optimism regarding yields and risks, supported by too loose economic policies, sharp growth in financial and real sector debt and a host of financial innovations, in an environment of diminished and inadequately enforced regulatory constraints in the financial system. The provisional – and unfortunately far from final – bill for this “easy ride”, as issued by the subsequent market correction and the materialisation of system risks, is high. It is taking the form of massive government and central bank support packages for the financial sector and an economic recession into which the advanced Western nations appear to be sliding.

1. The pre-crisis (initial) economic environment

The pre-crisis economic conditions in the advanced countries were characterised by seemingly unshakeable and dynamic economic growth. This was accompanied by relatively low and stable inflation and low interest rates¹, which stimulated rapid credit growth². The interaction between credit growth and prices of property and other assets fed an expansion of the asset market. The situation escalated to the point where price bubbles formed in these markets (especially the property market), inflated, among other things, by self-fulfilling expectations of further growth in asset prices. On top of that, huge volumes of liquidity seeking good investment opportunities had been created in the global economy owing to a long period of easy monetary policy. Low volatility and small differences in yields on assets with various levels of associated risk spurred the development of financial innovations. The spillover of global liquidity from market to market, combined with other factors, also generated a surge in world prices of food and energy-producing commodities. Against this background, the USA had for quite some time been maintaining sizeable current account deficits due, among other things, to the low savings rate in that country. On the other hand, current account surpluses in Asian countries and oil-exporting nations, which were being invested in U.S. financial assets and were thus helping to finance U.S. consumption, were adding to the pressure on U.S. financial markets. Political support for a massive expansion of home ownership in the USA was implemented, in part, through the U.S. government-sponsored organisations Fannie Mae, Freddie Mac and Ginnie Mae. These organisations were buying and managing large volumes of mortgages and issuing mortgage-backed securities (MBS).

2. Financial products and mechanisms underlying the current crisis

These economic conditions encouraged investors to take on additional risks in the search for yield. They were aided in this by a growing range of specific structured financial instruments offering investors more attractive yield-to-risk ratios than “traditional” financial products. In such circumstances, the **originate-to-distribute model** (ODM)³ became increasingly used in the financial system. This model allows a loan and its credit risk to be transferred into the financial system. Under the model, financial institutions do not hold the loans they grant in their balance sheets to maturity, but distribute them via specialised entities that issue structured financial products.⁴ These assets are then turned by special purpose vehicles (SPVs) into structured financial instruments, such as collateralised debt obligations (CDOs), which are then valued and sold to investors. As banks “sell” selected assets

¹ Especially in the USA in 2001–2005.

² This was caused by low long-term interest rates in the USA and a global savings surplus flowing from the countries accumulating forex reserves (China, Japan and the oil-exporting nations), which ramped up demand for U.S. government bonds (see below).

³ Traditionally a bank provided credit and held it in its balance sheet to maturity (the “originate-to-hold” model). In the interim it would receive payments of principal and interest. The situation changed with the emergence of special purpose vehicles (SPVs). Banks no longer hold loans to maturity, but “sell” them to final investors via SPVs, which create structured products. The ODM model is a part of a securitisation process whereby less liquid underlying assets are turned into more tradable securities. The specific forms of SPV include [conduits and SIVs](#) (structured investment vehicles).

⁴ Such products are usually a combination of loans of various types and quality (e.g. mortgages, credit card debt, consumer credit, etc.).

to SPVs and thereby remove them from their balance sheets, they also remove the credit risk from their books. This reduces the loan originator’s interest in accurately assessing the creditworthiness of borrowers and leads to relaxation of the lending requirements. As a result, the loan’s transferability from the bank’s balance sheet via a structured financial instrument takes over from the risk of default as the key lending parameter.

These financial instruments were attractive not only to investors, but also to other financial market participants. Their complex structure meant that they created new roles and thereby spawned a whole chain of relationships through which other intermediaries – such as rating agencies⁵ – became involved in the transactions. The innovations gave rise to a “parallel banking system” allowing further loan issuance with an unchanged stock of bank liabilities. Besides the SPVs mentioned above, this parallel banking system was made up of investment banks and investment and hedge funds. All were involved in sizeable long-term transactions in lent money, which they financed with short-term securities, and the system became heavily leveraged (see the figure below). Paradoxically, this parallel banking system was being driven forward by securitisation, which had originally been meant to mitigate system risk. Now, however, the failure of institutions in their new roles and the conflict of interests in the securitisation chain are conversely regarded as a cause of the current financial crisis.

The profit mechanism and the securitisation chain

In the hypothetical case of leverage profit mechanism (in the figure below), a key role is played by the spread (3% in this example), which allows the bank to make 3 units of profit margin for every 100 units invested in expanding its portfolio. From this perspective, the bank has an incentive to borrow and invest “as much as possible”. The risk is the situation where home owners default, the value of the MBS portfolio declines, refinancing gets more expensive, investors demand higher interest and the spread decreases.

Source: Wikipedia, CNB modifications

This mechanism is just one link in a chain in which other relations and entities also operate. SIVs (off-balance-sheet companies of parent investment banks) finance the issuing of CDOs⁶ (collateralised debt obligations) with ABCP⁷ (asset-backed commercial paper), which depends on money market conditions. Given the nature of its trading, risk exposure of the SIV grows beyond usual extent in two areas - insufficient liquidity and solvency problems. The liquidity risk stems from the fact that it borrows short term in the money market (where the ABCP rolls over) and invests longer term. It faces solvency risk if the value of the long-term investments it has bought (primarily CDOs) falls significantly and it is unable to meet its obligations as a result.

⁵ Structured instruments are rated by rating agencies, which try to estimate the probability of default of the security issuer as accurately as possible. These ratings are also used by selected groups of institutional investors (such as pension funds) as a “licence” from the regulator to purchase a given asset.

⁶ A CDO is a debt-backed obligation backed by an underlying pool of debt instruments such as MBS. The yields paid on the tranche are derived from the performance of the individual items of the underlying pool. CDOs are usually issued in three risk options (tranches). Each tranche has a different yield and a different risk (the higher the yield, the higher the risk of loss). If a credit event occurs in the underlying pool, the losses are applied first of all to the highest-risk “equity (first-loss) tranche” and, depending on the size of the loss, then to the “mezzanine tranche” and then to the “senior tranche”. The main reason for executing CDO transactions is that they offer the opportunity to profit from the arbitrage between the yields on the underlying pool assets (the CDO collateral) and the liability financing costs (the CDO tranches). The secondary motivation for CDO transactions is to reduce regulatory capital requirements by removing loans from the originator’s balance sheet.

⁷ SIVs issue ABCP and sell it to raise funds on the money market which they then use to purchase assets from a pool. ABCP is a form of short-maturity (usually 90–180 days) debt, and ABCP financing is usually cheaper than credit lines.

3. Other factors behind the crisis

In this context of a massive expansion of structured financial products, changes in the institutional environment also helped to bring on the current financial crisis. In particular, there was a gradual **relaxation of lending standards** and mortgage-granting conditions, as well as laxer supervision of housing loans. The prudential rules ceased to be applied. This was particularly true for the subprime segment of the U.S. mortgage market, i.e. households with a higher risk of default, lending to whom surged thanks to massive CDO securitisation and hence the transfer of risk into the financial system. These activities were stimulated by over-optimism and by the benefits of the transactions to all parties in the securitisation chain (fees on volumes of instruments sold, profit margins on transaction volumes, etc.). The Fed, moreover, decided in 2002 to exempt new mortgage lenders from supervision. The relaxation of regulatory and supervisory standards pertained not only to the mortgage market, but also to financial derivatives, which in 2000⁸ were exempted from the reserve requirements (Commodity Futures Modernisation Act). One very significant intervention in the system was **the granting of an exemption from the capital requirement rules** in 2004. This applied to investment firms with capital exceeding \$5 billion and thus benefited major investment houses such as Goldman Sachs, Merrill Lynch, Lehman Brothers, Bear Stearns and Morgan Stanley. This exemption meant a legal relaxation of the debt-to-net-capital ratio from the original 12:1 to around 30:1. This relaxing of SEC rules allowed investment banks to double their use of leverage. For comparison, the ratio was around 15:1 for deposit banks, whereas it was 70:1 in the case of Freddie Mac.

As mentioned above, the complexity of the securitisation chain allows intermediaries in the chain to make money from fees without bearing credit risk or putting their own capital into the transaction.⁹ The resulting structured financial products, however, are by their very nature difficult to value. External agents (rating agencies, underwriters, custodians) play a significant role, providing specific services without selling or buying these assets themselves. The whole system is critically dependent on confidence in counterparties.

The rating of a structured product is not identical to that of a corporate bond, in contrast to what many investors seem to think. The reason consists in the principle¹⁰ of risk distribution – pooling and tranching. Although this does spread the risk and create a security with a low probability of loss, the potential loss is far higher and more sensitive to the business cycle. Rating agencies failed to factor the decline in house prices into their models¹¹ and underestimated the effect of the decline in house prices on subprime default rates. Their models thus used the low default rate observed during the upward phase of the cycle. It should be added that the assessments performed by rating agencies related only to the risk of default and not to market or liquidity risk. Investors therefore wrongly interpreted the ratings as being comprehensive (i.e. as integrating liquidity, market and credit risk).

From the accounting standards perspective, structured products are valued at fair value¹². CDO valuation is based on models whose inputs are not directly observable. The valuation of CDO tranches is meanwhile influenced by the **correlation of default events** and recent developments have shown that this risk is not sufficiently reflected in the models¹³. In the early phase of the crisis (summer 2007)

⁸ CDOs are not regulated in any way. They are traded over the counter and there is virtually no secondary market.

⁹ Mortgage sellers are motivated to sell as many loans as possible, banks turn the loans into mortgage-backed securities (MBS), and investment banks (and their SIVs) “repackage” the MBS into complex CDOs.

¹⁰ From the nature of CDOs we know that the cash flows of the underlying pool are generated by its assets. There is a default linkage between similar groups of assets, and the potential losses are applied first to junior equity tranches. The ratings of structured securities could thus deteriorate far faster and more broadly than those of corporate bonds. Tranche ratings were more variable than corporate bond ratings. The features normally used as instrumental variables for rating corporate bonds are thus not equally suitable for structured products.

¹¹ Even though rising house prices in the USA over the past decade had been identified as a potential source of problems.

¹² Fair value is defined as the amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties in an arm's length transaction.

¹³ A correlation of approximately 0.2 had been assumed during the period of calm. By contrast, the correlation jumped to almost 1 during the crisis.

the indices of securities backed by loans (especially mortgages)¹⁴ fell and, given the CDO valuation method, pushed CDO prices downwards. This set off a spiral driven by massive sales of assets due to their falling value. The valuation of financial assets at fair value apparently has a procyclical effect on the financial markets. This procyclicality, however, is not due to the accounting standards themselves working with fair value, but stems from economic stimuli per se, with the accounting standards merely amplifying the cycle. Likewise, regulation can in some cases amplify the cycle by requiring some institutional investors to buy financial assets of a particular quality based on ratings. If an agency downgrades its rating, the investor is compelled by the regulator's requirements to sell the relevant asset, usually at a lower price than the investor thought. The rating downgrade does not cause a loss directly, but triggers a sale of assets, causing the market value of those assets to decline.

To sum up, in the pre-crisis period, investment banks, government-sponsored organisations, hedge funds and other institutions operated with high debt to capital ratios in an environment of low and stable interest rates. The entire financial system was caught up in a dangerous wave of growth and profit euphoria. Throughout the pre-crisis period, the risks of this situation being unsustainable existed. Attention was drawn to the financial stability threats stemming from this situation. From the present perspective, however, these risks were not properly appreciated, be it due to over-optimism or because the risk management models, product valuation models and rating models either did not reflect these risk or underestimated them.¹⁵

4. The crisis erupts: Course, manifestations and implications

In summer 2007, the housing market in the USA started experiencing rising delinquency on mortgage loans. This situation was caused by rising interest rates on adjustable-rate mortgages and by rising interest rates in general (up to 5%). The bursting bubble on the housing market simultaneously caused the value of property used as mortgage collateral to start falling. Mortgage lenders started insisting that lenders make up the shortfall in collateral value, but their low-income clients could not afford to meet these demands. That sums up the early phase of the crisis, known at the time as a subprime crisis ([see CBM September 2007](#)). Unfortunately, however, the problem of subprime mortgages (and other loss loans) was not isolated and soon spilled over much more seriously into the sector of securities backed by these loans and other markets in structured products. Large quantities of such securities were owned by financial institutions not only in the USA, but also in Europe and other parts of the world. Owing to the aforementioned linkages within the securitisation chain, there was a rise in **system risk** over time. This risk materialised when the crisis erupted as a result of falling property prices and mass defaults in the subprime sector.

The events in summer and autumn culminated in **liquidity problems, a lack of credible information and a collapse of confidence between financial market participants**. Information was inadequately and asymmetrically distributed along the entire securitisation chain. Rating agencies faced a loss of confidence following a wave of rating downgrades. Most significantly, it was unclear which institutions were exposed to structured financial products and to what extent they were threatened by losses from such holdings. Furthermore, information on the prices of these products became unreliable or unavailable. The collapse of confidence led to a rise in the interest rate spread. Risks were reassessed and refinancing costs rose. The liquidity problems (the financial crisis was regarded in its initial phase as a liquidity crisis) proved to be very severe, as they increased the refinancing costs of

¹⁴ For example, ABX market indices, which reflect the value of particular asset types, in this case ABS. The indices are expressed as averages reflecting the value of dollar investments in a broadly diversified portfolio of ABS with a particular rating.

¹⁵ The main risks were the following: (i) Loss of information on credit quality, as transparency fell heavily owing to the processes needed to create structured products, i.e. owing to the pooling of loans in the underlying pool and the creation of tranches. (ii) Correlation risk (the higher the correlation between defaults, the greater the risk of mass defaults on individual items of the underlying pool. (iii) Concentration risk – a limited group of participants trades in credit derivatives, and that group is usually heavily leveraged and reacts sensitively to rising refinancing costs. Linked with this is (iv) liquidity risk, i.e. the ability to raise funds. To a large extent the “classic” (v) market risk of illiquid structured products also existed. Moreover, a large degree of leverage is built into the debt instruments that form the basis of CDO products. One can say that “tranching” gives rise to another layer of leveraging, implying increased susceptibility to losses.

the full spectrum of market participants.¹⁶ During the liquidity crisis, i.e. at the start of the overall financial crisis, it became all too clear that the financial innovations were heavily dependent on market liquidity. This culminated in the simultaneous materialisation of credit, market and liquidity risk.

The significant deterioration in investment firms' balance sheets resulting from write-offs of problem assets led to **solvency problems** in these institutions. As time progressed, the primary problems with liquidity and with refinancing liabilities therefore began to put the health, and in some cases the very existence, of financial institutions at risk.¹⁷ Given the massive falls in prices of structured products, the value of the assets held in investment banks' balance sheets also fell, endangering their ability to meet their obligations. It turned out that credit risk had not entirely vanished from the system and parent banks were forced to take their off-balance-sheet SIVs and conduits back under their wings, further worsening those banks' financial condition.

The situation escalated when the banking and entire financial world experienced a series of collapses of investment banks (Bear Stearns and Lehman Brothers) and the mass "nationalisation" or forced takeover of major investment firms and insurance companies by their competitors (Merrill Lynch, Wachovia, Fortis, Dexia, AIG and the Icelandic banks). The collapse of the major investment bank Lehman Brothers (15 September 2008) is generally regarded as the critical moment when the previously localised liquidity and solvency crisis in the U.S. mortgage sector exploded into a global financial crisis of vast proportions. Not only did this bank have huge exposure to structured products, but it was also highly leveraged (as in the case of Bear Stearns¹⁸). By contrast, the bankruptcy of Washington Mutual, the largest U.S. savings and loan association, was due more to a shortage of liquidity for its trading activities than to over-exposure to CDOs and other structured products.

5. Actions taken by central authorities during the financial crisis

Central banks and governments reacted to the financial sector's problems and to the collapses and forced takeovers of financial corporations in various ways and to various degrees. The central banks in the USA, the euro area and the UK supported the interbank market by supplying extraordinary liquidity and by expanding the range of instruments they use^{19,20}. The BoE initially (until December 2007) relied mainly on its standing facility and later expanded the range of eligible collateral for money market operations. By contrast, the ECB almost from the start widened the range of collateral, extended the maturities of its operations and actively managed the provision of liquidity. The Fed responded primarily by lowering its key interest rates (from 5.25% in summer 2007 to the present 1%) and in the later phase, up to the present, by expanding its [range of facilities](#) to include operations targeted at particular segments of the financial market, for example the Primary Dealer Credit Facility ([PDCF](#)) and the [ABCP MMMF](#) liquidity facility.²¹ Swap lines allowing domestic currency to be exchanged for dollars were also established between the Fed and several other central banks.²² These

¹⁶ For example, they increased house buyers' borrowing costs. Hedge funds had problems rolling over their leveraged positions, as they faced capital withdrawals by clients and were asked to provide increased collateral. Money market funds were forced to sell downgraded assets, as the regulations only allowed them to hold the highest-rated securities. SIVs faced increasing problems with financing CDO issuance, as it was no longer easy to roll over ABCP and in the better case they had to use more expensive credit lines from their parent banks.

¹⁷ A key factor here was the materialisation of concentration risk and the interconnectedness of major companies in the structured product sector. Investment banks not only issued structured products, but also held them in their trading portfolios, often with inadequate risk assessment.

¹⁸ Bear Stearns was bought by JP Morgan Chase on 25 March 2008 for \$10 a share. In August 2007, its share price had been \$205 a share.

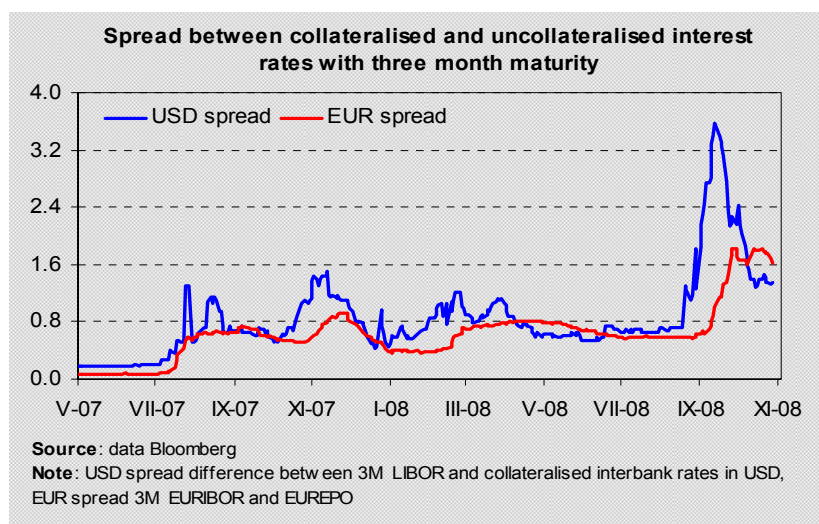
¹⁹ For a description of their operations, see the March 2008 issue of [Central Bank Monitoring](#) and the news section in the [June 2008](#) edition.

²⁰ The liquidity crisis has necessitated changes in central bank facilities. In a nutshell, those changes are: (i) longer financial instrument maturities, (ii) a wider range of assets eligible as collateral: (iii) a wider range of financial institutions to which CBs are willing to lend, and (iv) larger-volume operations.

²¹ This facility was introduced in September 2008 and testifies to the Fed's efforts to react to the needs of individual segments of the financial system.

²² Australia, Brazil, Canada, Denmark, the euro area, Korea, Japan, New Zealand, Mexico, Norway, Singapore, Sweden, Switzerland and the UK.

operations have over time been expanded to a larger number of central banks and conducted in larger volumes owing to greater demand for dollar financing. In recent quarters, central banks have also slashed interest rates (see the opening pages of recent editions of *Monitoring*). There has even been a coordinated interest rate reduction of 50 b.p. by G10 central banks. These sizeable and often coordinated rate cuts by central banks and the introduction of new liquidity-providing facilities have been done in an attempt to stop the interbank money markets freezing up, to eliminate any unintended and inappropriate tightening of monetary policy, to keep credit accessible to entities from the real economy and thus to avert the danger of economic recession and a related further deterioration in the soundness of the financial sector.



Central banks (especially the Fed) have also temporarily taken lower quality assets than Treasury bills and government bonds into their balance sheets (in the form of collateralised lending operations and, in the case of the BoE via a Special Liquidity Scheme). The previously stable balance sheets of the [Fed](#), the [BoE](#) and the ECB started rising sharply in September 2008.²³ Although central banks have supplied the financial system

with copious liquidity, they have not succeeded in bringing down interbank rates or the spreads between collateralised and uncollateralised money market instruments (see the chart) to their pre-crisis levels.

The specific actions undertaken by **government authorities** to bolster the solvency and financial soundness of systematically important financial institutions can be split into four main categories: (i) increased deposit guarantees²⁴ and new guarantees of interbank loans²⁵, (ii) direct capital injections into private financial institutions²⁶, (iii) purchases of problem assets by funds set up by the government, (iv) other facilities and measures applied by government authorities in order to restore confidence in financial markets and stabilise the financial system. The following table summarises the approximate amounts of financial support provided.

²³ The rise in the Fed's assets is due to both refinancing facilities and newly established facilities involving purchases of commercial paper (ABCP). The Fed is thereby attempting to clean up the balance sheets of important financial institutions and restore confidence between them so that they are once again willing to lend to the economy and enable markets to function. The BoE's assets have risen mainly because of a rise in long-term reverse repo operations.

²⁴ The minimum guarantee for insured deposits in the EU countries is now €50,000, and some states are offering unlimited guarantees.

²⁵ Some governments of EU countries are guaranteeing new bank loans with 5-year maturities issued until December 2009.

²⁶ Capital injections targeted primarily at Tier 1 capital, usually in the form of preference shares purchased by the government.

Table: Selected actions of central authorities – rescue packages (billions)

	<i>Guarantee of interbank liabilities</i>	<i>Capital injection</i>	<i>Purchase of problem assets</i>	<i>Other programmes and measures</i>
USA	\$1,400	\$250 ¹	\$450 \$800 ²	\$185 ³
UK	£250	£50		£200 ⁴ £149 ⁵
Euro area⁶	€1,140 ⁷	€242.3	€52.5	

Sources: Press releases, [BoE FSR October 2008](#) p. 33, CNB modifications, data approximately as of 26 November 2008

Notes: ¹ excludes \$20 billion capital injection in Citigroup, as no information was available on whether this \$20 billion is coming from the overall \$250 billion programme (so far \$125 billion has been distributed to nine institutions and the remainder to other organisations through an application process) or from outside this programme; ² new plan to purchase assets (mortgage-backed debt and consumer debt securities); ³ includes [TSLF](#) outstanding as of 25 November 2008; ⁴ [Special Liquidity Scheme](#); ⁵ £99 billion Northern Rock and £50 billion Bradford & Bingley; ⁶ includes Austria, Belgium, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal and Spain; ⁷ all euro area countries are guaranteeing newly issued bank loans with 1–5-year maturities (depending on the country) issued until December 2009; the figure given in the table is the sum of the values given in Table 2 in [BoE FSR October 2008](#) p. 33. plus France €320 billion.

These four main categories (inspired, among other things, by the UK rescue plan²⁷) have also become the pillars of the approach of the EU countries, as implemented in various national modifications. Regardless of the high costs involved, governments have declared an active interest in preventing the failure of systematically important financial institutions, averting the threat of a chain reaction (domino effect) in the financial system, and supporting the banking sector in its ability to lend to the real economy.

6. Conclusion

The macroeconomic causes of the current financial crisis and the related imminent economic slump lie in too loose monetary policies in a context of globally integrated financial markets and global imbalances. However, the crisis is also due in large part to microeconomic factors relating to financial innovations and to the structure of financial instruments and financial markets. The situation should thus be remedied²⁸ and probability from recurring reduced by a correction towards prudent macroeconomic stabilisation policies in the medium term and by measures targeted at eliminating the microeconomic causes of the instability. Private entities should behave with prudence, appropriately reinstate practices for the management of financial risk (liquidity risk in particular) and abide by those practices. As regards financial market regulation and supervision, it would seem to be appropriate to consider amending the current regulatory standards with a view to suppressing procyclicality, and to rigorously enforce discipline and compliance with the prudential rules by private entities. It will also be necessary to increase the transparency of particular groups of the financial system and force them to provide undistorted information on the exposure of specific entities to complex financial products. The recent developments also call for consideration of the creation of effective debt constraints. These measures should be based on a coordinated and systematic approach by national regulators and not on ad-hoc regulatory interventions made under time and other pressures. The experience of some countries suggests that merging regulatory and supervisory authorities into central banks can be an advantage during such financial crises. Monetary policy can by no means resolve all the problems with its standard facilities, so it is vital that macroprudential and regulatory measures form part of the comprehensive solution prescribed by central banks.

²⁷ For information, see, for example, <http://www.bankofengland.co.uk/publications/fsr/2008/fsrfull0810.pdf>, p. 31, Box 5.

²⁸ By remedying the situation we mean finding an effective long-term solution to the instability of the financial sector, not just short-term “fire-fighting” or deferral of the problem with measures such as the emergency supply of liquidity to the financial system, bank nationalisation, provision of guarantees and capital injections.

4. Selected speech: Lars Nyberg on challenges following the current crisis

In this part we summarise the speech “Challenges Following the Current Crisis” given by Lars Nyberg, Deputy Governor of Sveriges Riksbank, at the 12th annual conference of the Central Bank of Chile in Santiago on 6 November 2008.

In his speech, Lars Nyberg looked back at the course of the current financial crisis and then addressed the challenges that governments, central bankers and regulators will face after it ends. He began by saying that the current crisis has come to be less about credit risks and more about the consequences of experiments in the global financial industry and a “deleveraging” process. He pointed out that times of financial turbulence are unavoidable and that financial crises are never exactly the same. Therefore, we have to learn from previous crises and incorporate sufficient flexibility into the preventive frameworks.

Dr Nyberg then introduced the future challenges that he feels are connected with the present crisis. The first is in the monetary policy area, i.e. the type and extent of the monetary policy response to the rapid growth in asset prices and the associated credit expansion. He believes that monetary policy should only respond to an increase in asset (house) prices if the central bank’s forecasts indicate a high risk of overheating and excessively high inflation. If the economy is not threatened by such a scenario, the appropriate strategy is to wait and see, but be prepared to react quickly. According to Dr Nyberg, monetary policy is perhaps not the most efficient instrument for preventing asset price bubbles and crises from happening, even though a too loose monetary policy may contribute to the build-up of such undesirable situations.

A better way to prevent such situations from arising is to have the right rules and supervision in place, and to make them more effective rather than imposing more and heavier regulations. Dr Nyberg sees this as the second challenge and lesson of the current crisis. While he does not rule out expanding and tightening the regulatory and supervisory framework, this can only be done in the event of market failure and if it is certain that the overall benefits exceed the costs. The third challenge, says Dr Nyberg, is the need to strengthen the authorities’ preparedness in the crisis management area. In the vast majority of cases in the past, the authorities have had to rely on ad-hoc solutions, and this has often led to measures being adopted too late and inconsistently. Greater crisis preparedness can be achieved by having a solid framework for assisting distressed banks. This framework should include detailed procedures ranging from deposit guarantee schemes to insolvency procedures, with a mix of legal and financial measures. These procedures can differ from country to country, but the basic framework should be the same everywhere. It should, for example, define procedures to facilitate the quick and efficient closure of banks at minimum cost to the deposit guarantee system and declare the responsibilities of shareholders and uninsured creditors for their investment decisions. It must also cover exceptional situations where the entire banking sector is at risk of collapse, and it is also often necessary to give the authorities a stronger negotiating position. The fourth challenge to the authorities in tackling the current financial crisis, says Dr Nyberg, is the need for greater cross-border cooperation and harmonisation of crisis management, regulation and supervision in the context of increasingly integrated financial markets. In his view, inadequate cross-border coordination has complicated the management of the ongoing crisis.

Dr Nyberg concluded by looking at the implications for central banks’ work on analysing financial stability and systemic risks. He regards this work as more important than ever. However, he says that the traditional approach to analysing institutions, markets and infrastructure separately is no longer sufficient. He feels that more emphasis should be put on analysing the interplay between them and identifying potential contagion channels. The analyses should also contain a broader international outlook and should not underestimate non-banks. In his opinion, they should also cover the risk of regulatory failures, including recognition of the scope for circumventing regulation. Cooperation on harmonising the analytical approaches applied would also be desirable going forward.

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