



III THE EURO AREA FINANCIAL SYSTEM

3 EURO AREA FINANCIAL MARKETS

Since late November, conditions in the euro money market have improved, not least because of supportive central bank measures. Some banks, however, have remained heavily dependent on central bank funding.

Government bond markets have been characterised by increased discrimination among investors vis-à-vis different euro area sovereign issuers, in large part because of intensified concerns about the fiscal sustainability risk created by national financial rescue and economic stimulus packages.

In contrast to speculative-grade debt, the demand for, and issuance of, investment-grade corporate bonds has rebounded markedly, while asset-backed securities markets have remained largely dysfunctional and market participants should, therefore, continue to implement various public and private initiatives aimed at restoring securitisation markets. Increased public borrowing might crowd out some investments into private debt, and it would be prudent for borrowers to consider various alternative funding sources well before the actual rollover of maturing debts, as well as to avoid too high a reliance on short-term borrowing despite low short-term interest rates and investors' preference for such debt.

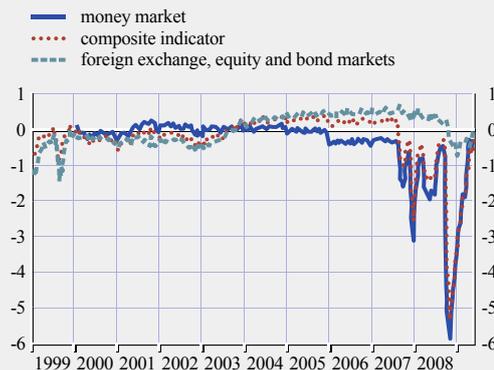
Notwithstanding a rally in equity markets, high option-implied volatility and the uncertainty about the macro-financial outlook cast doubt on the sustainability of the recovery and market participants should remain vigilant with respect to their investments and counterparty credit exposures.

3.1 KEY DEVELOPMENTS IN THE MONEY MARKET

Market liquidity in the euro money market – as measured by the financial market liquidity indicator shown in Chart 3.1 – improved significantly after the finalisation of the December 2008 Financial Stability Review (FSR), but still remained below the pre-turmoil levels

Chart 3.1 Financial market liquidity indicator for the euro area and its components

(Jan. 1999 – May 2009)



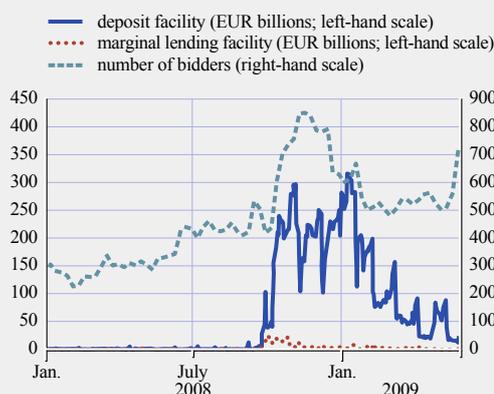
Sources: ECB, Bank of England, Bloomberg, JPMorgan Chase & Co., Moody's KMV and ECB calculations.

Note: The composite indicator comprises unweighted averages of individual liquidity measures, normalised on the period 1999-2006 (non-money market components) and 2000-2006 (money market components). The data shown have been exponentially smoothed. For more details, see Box 9 in ECB, *Financial Stability Review*, June 2007.

at the end of May. Since mid-February 2009, further signs of improved money market liquidity have also been seen in the lower utilisation of the ECB's deposit facility (see Chart 3.2) and higher overnight unsecured interbank transaction volumes (see Chart 3.4). These improvements were largely the consequence of the policy measures that were taken by the Eurosystem.

Chart 3.2 Recourse to the ECB's marginal lending and deposit facilities and the number of bidders in main refinancing operations

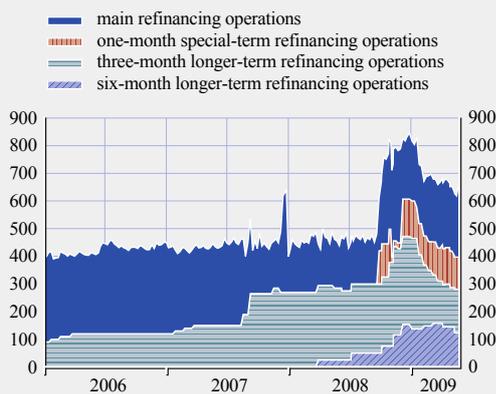
(Jan. 2008 – May 2009)



Source: ECB.

Chart 3.3 Breakdown of Eurosystem liquidity-providing operations by maturity

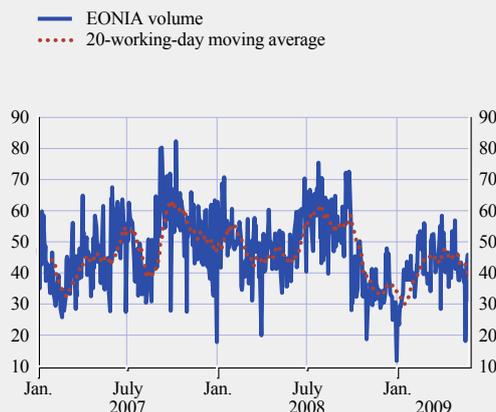
(Jan. 2006 – May 2009; EUR billions)



Source: ECB.

Chart 3.4 EONIA volume

(Jan. 2007 – May 2009; EUR billions)



Source: ECB.

The measures taken by the Eurosystem were aimed at restoring the functioning of the money market and alleviating the extreme levels of stress that prevailed after the failure of Lehman Brothers. They included (i) the introduction of a fixed rate tender procedure for the main refinancing operations, meaning that the Eurosystem met in full all bids received in the euro liquidity-providing operations at a preset policy rate; (ii) the temporary narrowing of the corridor between the standing facility rates from 200 to 100 basis points and (iii) the expansion of the list of assets eligible as collateral in Eurosystem credit operations.

As a result of these measures, the intermediation role of the Eurosystem increased significantly (see also Box 7): between mid-September and the end of 2008, the amount of outstanding euro liquidity-providing operations almost doubled

(see Chart 3.3), while the use of the deposit facility remained at record levels (see Chart 3.2).

The redistribution of liquidity within the interbank market remained severely impaired towards the end of 2008. Indeed, interbank lending had contracted even at the shortest maturities, as evidenced by a decline in the daily EONIA volume (see Chart 3.4). However, the abundant liquidity provided by the Eurosystem led to a substantial downward drift of very short-term money market interest rates to levels significantly below the policy rate. This also fed through to longer maturities and, together with the cumulative ECB interest rate cuts, contributed to a substantial decline in the unsecured interest rates along the money market yield curve. At the same time, EURIBOR/OIS spreads narrowed significantly from the record high levels that prevailed in October 2008 (see Chart 3.5).

Box 7

MONEY MARKET INTERMEDIATION AND LIQUIDITY INSURANCE

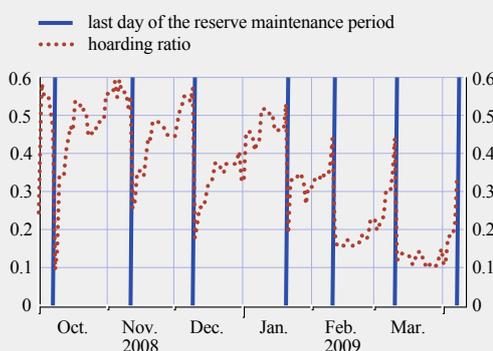
Following the change to a fixed rate tender procedure with full allotment as of the maintenance period beginning on 8 October 2008, aggregate liquidity provision in Eurosystem refinancing operations increased significantly, exceeding the strict needs resulting from autonomous factors and reserve requirements. The aggregate excess liquidity has been reflected in an elevated recourse to the deposit facility of the Eurosystem. This box discusses some factors that may help to explain the demand for excess liquidity by focusing on the financial stability dimension of the operational framework for monetary policy implementation in times of financial market stress. In fact, the empirical evidence suggests that, in addition to partially taking over the intermediation of liquidity shocks from the market, the Eurosystem has offered banks insurance against liquidity uncertainty and has therefore contributed actively to operational and financial stability.

A look at the ratio of recourse to the deposit facility over outstanding longer-term refinancing operations (LTROs) – which is a measure of liquidity hoarding by banks (hereinafter referred to as the hoarding ratio) – reveals a clear intra-maintenance period pattern, as well as a declining trend in recent months (see chart). The former pattern can be attributed to banks' desire to frontload the fulfilment of their reserve requirements. In the presence of aggregate excess liquidity, therefore, recourse to the deposit facility increases towards the end of the reserve maintenance period.¹ Controlling for these structural elements, the remaining variation in the recourse to the deposit facility can be explained by four factors (see the model results in the table):²

- a) overall financial market stress (as measured by the VIX, an index of implied stock market volatility);
- b) the difference between EONIA and the minimum bid rate;
- c) the re-widening of the interest rate corridor as from 21 January 2009;³ and
- d) the lagged hoarding ratio (in the error correction model).

Ratio of recourse to the ECB's deposit facility over outstanding longer-term refinancing operations

(Oct. 2008 – Apr. 2009, six reserve maintenance periods)



Sources: ECB and ECB calculations.

1 The abrupt decline in the recourse to the deposit facility on the last day of the reserve maintenance period results from the fact that an absorbing operation at higher rates usually takes place on the last day of each reserve maintenance period. Without such an operation, the aggregate recourse to the deposit facility on that day would likely be higher than on any other day during the maintenance period.

2 Two asymptotically identical approaches were considered. One involves estimating an error correction model of differences in the daily recourse to the deposit facility, while the second consists in estimating the hoarding ratio directly. The first approach takes the dynamic adjustment to equilibrium into account, while the second stipulates a reduced form and hence amounts to estimating the long-run equilibrium directly. The relationship between the two approaches becomes visible by solving the error correction model for its long-run equilibrium values. These values are within one standard deviation from the estimates obtained using the reduced form model.

3 From October 2008 to January 2009, the interest rate corridor formed by the rates on the standing facilities of the Eurosystem was narrowed to 100 basis points (from 200 basis points).

Estimation results from the error correction model

Δ log deposit facility	Coefficient	t-statistic
Constant	-1.174	-3.13
Δ log LTRO	0.742	1.94
log hoarding ratio _{t-1}	-0.245	-5.34
log VIX _{t-1}	0.221	2.45
Spread of EONIA over minimum bid rate _{t-1}	-0.395	-3.81
Rewidening of the interest rate corridor (dummy variable)	-0.327	-4.87
Daily reserve surplus	-0.001	-1.61
Last day of reserve maintenance period (dummy variable)	-0.588	-9.28

Source: ECB calculations.
Note: Estimation is based on 124 observations over six reserve maintenance periods, $R^2 = 0.55$.

term captures the idea that changes in daily recourse to the deposit facility are one way of achieving an average (targeted) hoarding ratio.

Both demand factors have important financial stability implications. While re-intermediation of liquidity shocks contributes directly to the stability of the banking sector by guaranteeing a smooth fulfilment of arising payments, the provision of insurance in the form of liquidity buffers allows banks to adjust their day-to-day liquidity position in times of greater uncertainty, which promotes operational and financial stability.

The econometric evidence suggests that increasing financial market tensions, gauged by the volatility index, lead to increasing recourse to the deposit facility.⁴ The intuition behind this finding is that stock market volatility is correlated with banks' asset volatility which, in turn, may cause sudden rating downgrades and change the funding position of the bank. Both factors contribute to retrenchment from interbank lending and thereby increase the re-intermediation role of the Eurosystem. The finding can also be interpreted as banks' natural reaction to an increased overall risk aversion in the market: increasing liquidity buffers is an optimal response in such an environment.

The spread between EONIA and the minimum bid rate is a measure of the prevailing opportunity costs of obtaining funds from the Eurosystem (instead of using the overnight market) and a measure of excess liquidity at overnight maturity. Higher opportunity costs and excess liquidity will lower the demand for central bank refinancing and hence lower the recourse to the deposit facility, which is captured by the negative coefficient of the spread.

Finally, the re-widening of the interest rate corridor between the marginal lending facility and the deposit facility from 100 basis points to 200 basis points on 21 January led to a decrease in recourse to the deposit facility. Economically, a re-widening of the interest rate corridor increases the cost of insurance against liquidity shocks, since funds demanded for insurance purposes are obtained at the policy rate with the expectation of parking those funds in the deposit facility.

Theoretically, two different factors of demand for refinancing with the Eurosystem can be distinguished. The first is the partial replacement of private sector intermediation of liquidity shocks by the Eurosystem owing to the fear of adverse selection by money market participants. This leads to a drying-up of money market transactions as a result of the reduction in external credit lines of banks (credit rationing). The second is an increased preference for holding liquidity buffers in the presence of an increased variability and likelihood of liquidity shocks and fear of sudden credit events. Furthermore, in the econometric modelling, an error correction

4 While the main specification referred to in the text is an error correction model with the change in the daily recourse to the deposit facility on the left-hand side and variables a) to d) on the right-hand side, a range of alternative approaches were used to check for robustness in the presence of data limitations. The results are preserved under each approach, while the quantitative dispersion is limited.

The estimates suggest that the marginal effect of financial market volatility is somewhat smaller than that of the re-widening of the interest rate corridor, although the former variable captures more of the variation in recourse to the deposit facility. The largest marginal effect is observed via the opportunity cost measure (the spread). The re-widening of the interest rate corridor is estimated to have contributed to a reduction in recourse to the deposit facility in the range of €40 to €50 billion. The strength of the effect, as well as its robustness, regardless of the chosen econometric approach, reveals the presence of a strong insurance motive behind the elevated demand for Eurosystem refinancing after 8 October 2008.

Overall, in times of unprecedented financial market stress that puts severe strains on the financial system, the flexibility of the operational framework for monetary policy implementation of the Eurosystem can be seen as contributing to safeguarding financial stability.

In order to provide incentives for banks to increase interbank lending, as of 21 January 2009 the ECB restored the interest rate corridor between the standing facilities to ± 100 basis points around the policy interest rate. As a result, the ECB's intermediation role decreased, albeit very gradually, and was accompanied by a pick-up in interbank lending volumes, although primarily at shorter maturities. Banks started to lend more to each other and their excess reserves with the Eurosystem diminished.

On 5 March 2009, the ECB announced that it would continue the fixed rate tender procedure with full allotment for its refinancing operations for as long as needed, and in any case beyond the end of 2009. This provided strong assurance for money market participants regarding the unlimited availability of collateralised liquidity from the ECB and thereby reinforced positive sentiment.

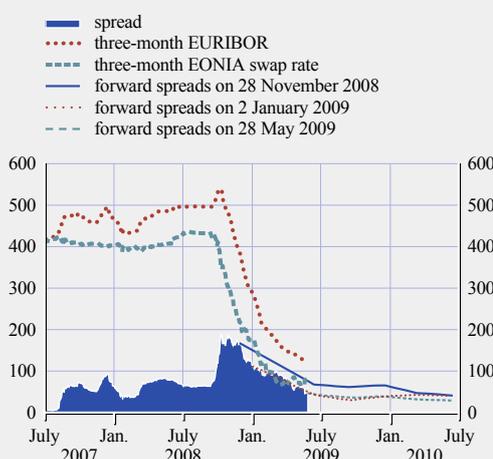
On 7 May 2009, a further set of measures, aimed at enhanced credit support, were announced. These measures encompassed (i) the introduction of liquidity-providing longer-term refinancing operations with a maturity of 12 months; (ii) purchases of euro-denominated covered bonds issued in the euro area and (iii) granting the European Investment Bank counterparty status for the Eurosystem's monetary policy operations. Aimed at promoting recovery in the term money and other funding markets, the announcement of these measures provided additional impetus to gradually improving conditions at the longer end of the money market maturity spectrum, whereas

spreads narrowed in the covered bond market. Furthermore, the main policy interest rate was reduced to 1% and the interest rate corridor between the standing facility rates was narrowed to ± 75 basis points.

Although conditions in the euro money market had improved by the end of May, various indicators suggest that market liquidity conditions still remained strained (see Chart 3.1 and Box 8). Forward EURIBOR/OIS spreads indicated expectations of some tentative tightening of spreads in 2009, but it was anticipated to be very gradual (see Chart 3.5).

Chart 3.5 Contemporaneous and forward spreads between EURIBOR and EONIA swap rates

(July 2007 – July 2010; basis points)



Source: Bloomberg.

Interbank lending volumes beyond the one-month maturity remained limited and there was reportedly little turnover behind declining EURIBORs for maturities exceeding three months. Among other factors, the reluctance of money market funds to invest in money market instruments with longer maturities, stemming from a fear of considerable withdrawals, reinforced the concentration of liquidity at the front end of the money market yield curve,

although this reluctance seemed to have waned somewhat in May 2009.

Widespread risk aversion and counterparty risk concerns (see Chart S70) continued to underpin the segmentation of the euro money market on the basis of perceived creditworthiness. This continued to impair access to interbank funding for some banks and reinforced their reliance on central bank funding.

Box 8

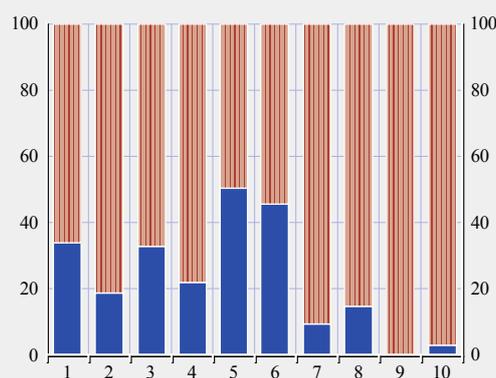
INDICATORS OF LIQUIDITY IN THE EURO MONEY MARKET

Since August 2007 the euro money market has experienced severe disruptions as a result of contagion from shocks in other market segments, an increased preference for liquidity and heightened counterparty credit risk concerns. However, changes in liquidity conditions have not been homogeneous across the various segments of the euro money market. This box presents a simple “barometer” which can help in the monitoring of market conditions across those segments.

The barometer consists of eight indicators of money market functioning, covering the following segments: unsecured deposits (EONIA volume, standard deviation of the three-month EURIBOR), repos (EURIBOR/EUREPO spread, standard deviation of the three-month EUREPO), euro commercial paper (ECP outstanding), interest rate futures (trading volume of EURIBOR futures), swaps (bid-ask spread of EONIA swaps), and the foreign exchange swap market (US dollar basis swap spread). Two additional indicators reflect the degree of intermediation by the ECB (number of bidders in the main refinancing operations and total use of the marginal lending facility and of the deposit facility). The barometer compares the level of each indicator on a certain day with its pre-turmoil level (calibrated as zero on the scale) and with its level at the “peak” of the turmoil (calibrated as 100). While the pre-turmoil readings are taken on the same day for all indicators, the day corresponding to the turmoil “peak” level is different for each indicator. Charts A to C show this barometer at three different stages in the recent market turmoil.

Chart A Euro money market barometer on 1 January 2008

(percentages; pre-turmoil level taken on 16 July 2007)

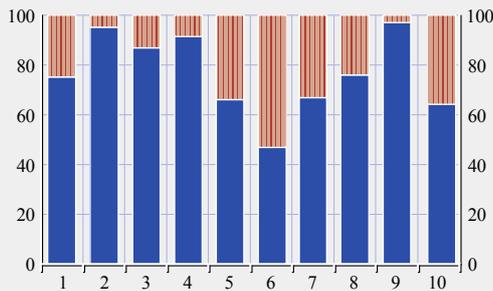


- 1 EONIA volume
- 2 standard deviation of EURIBOR
- 3 EURIBOR/EUREPO spread
- 4 standard deviation of EUREPO
- 5 ECP outstanding
- 6 EURIBOR futures trading volume
- 7 EONIA swap bid-ask spread
- 8 USD implied rate vs. USD LIBOR
- 9 number of bidders in main refinancing operations
- 10 total use of marginal lending facility and deposit facility

Sources: Bloomberg, European Banking Federation, CPWare and ECB calculations.

Chart B Euro money market barometer on
1 December 2008

(percentages; pre-turmoil level taken on 16 July 2007)

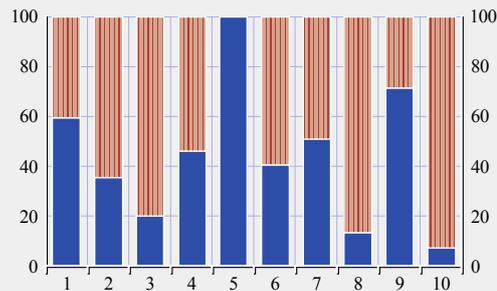


- 1 EONIA volume
- 2 standard deviation of EURIBOR
- 3 EURIBOR/EUREPO spread
- 4 standard deviation of EUREPO
- 5 ECP outstanding
- 6 EURIBOR futures trading volume
- 7 EONIA swap bid-ask spread
- 8 USD implied rate vs. USD LIBOR
- 9 number of bidders in main refinancing operations
- 10 total use of marginal lending facility and deposit facility

Sources: Bloomberg, European Banking Federation, CPWare and ECB calculations.

Chart C Euro money market barometer on
28 May 2009

(percentages; pre-turmoil level taken on 16 July 2007)



- 1 EONIA volume
- 2 standard deviation of EURIBOR
- 3 EURIBOR/EUREPO spread
- 4 standard deviation of EUREPO
- 5 ECP outstanding
- 6 EURIBOR futures trading volume
- 7 EONIA swap bid-ask spread
- 8 USD implied rate vs. USD LIBOR
- 9 number of bidders in main refinancing operations
- 10 total use of marginal lending facility and deposit facility

Sources: Bloomberg, European Banking Federation, CPWare and ECB calculations.

The collapse of Lehman Brothers in September 2008 heightened perceived counterparty risks and led to a sharp reduction in liquidity across money market segments (see Chart B). Liquidity dried up even for the shortest maturities and secured transactions, while trading in interest rate futures and swaps was negatively affected by extreme volatility and widespread deleveraging. The dysfunction of the euro money market prompted the ECB to assume a greater intermediation role. From the beginning of 2009, liquidity conditions improved across most segments of the euro money market. However, this improvement was very gradual and liquidity conditions remained far from pre-turmoil levels (see Chart C).

The functioning of the secured segment of the money market was also adversely affected by the failure of Lehman Brothers. This occurred because the event triggered a dramatic increase in perceived counterparty risk among market participants. This led to further reductions in counterparty credit limits. Simultaneously, many banks accelerated the pace of deleveraging their balance sheets.

The International Capital Market Association's most recent semi-annual European repo market survey, conducted in December 2008, showed a dramatic decline in the size of the euro secured money market. For instance, the overall

value of repo contracts outstanding fell from €6.5 trillion in June 2008 to €4.6 trillion in December 2008. For a constant sample of survey participants, the contraction of 26% was the largest since the first survey of this kind was conducted in 2001.

Greater risk aversion was also reflected in an increased preference for short maturities and high-quality collateral, as well as, in particular, in the larger share of anonymous trading cleared through a central counterparty (CCP). The share of outstanding repo contracts that were anonymously traded and cleared with a CCP rose from 13% in June 2008 to a record high of

18% in December, according to the survey.¹ The balance sheet efficiency achieved through netting and the elimination of the direct credit counterparty risk, which helped to circumvent non-existent or reduced credit lines, contributed to the rapid growth of CCP repos. As liquidity in the term repo market remained severely impaired, market participants were increasingly attracted by the advantages provided by the CCP facilities.

Reflecting the importance of, and preference for, collateralised lending that resulted from increased risk aversion, Banca d'Italia, together with the operator of the e-MID electronic interbank market (e-MID SIM), launched an initiative to revive interbank lending. The "Mercato Interbancario Collateralizzato" (MIC) scheme started operating on 2 February 2009 and provided a platform for collateralised and anonymous interbank lending with terms from one week to six months.² Daily trading activity on the platform gradually increased and the outstanding amount reached €4.1 billion at the end of April 2009, but then declined slightly in May 2009. Nevertheless, already by the end of March 2009, the outstanding amount of MIC deposits exceeded that of the e-MID unsecured market for maturities from one week to six months.

The bankruptcy of Lehman Brothers also marked a turning point for the euro commercial paper (ECP) market. In particular, there was a steep decline in the ECP amounts outstanding and the number of trades. After a tentative improvement in January, the contraction in the ECP market resumed in February, albeit at a more moderate pace, as maturing amounts outpaced new issuance. The asset-backed ECP segment was affected most strongly, with the amounts outstanding almost halving after the finalisation of the December 2008 FSR. In spite of the general decline across issuers, the outstanding volumes of ECP issued by banks stabilised. Their share reached 75% of the total ECP outstanding³ in March 2009 and remained at that level at the end of May 2009. However, at

the end of May the volume of bank-issued ECP was only two-thirds of the volume seen prior to the failure of Lehman Brothers.

In the ECP market, investors demanded high-quality paper and were very discriminating with regard to issuer ratings and sectors, with a preference for shorter-dated securities. Although the share of ECP issued with maturities of less than one month declined from a record 50% in the fourth quarter of 2008, it still accounted for almost 40% in the first quarter of 2009.

Some investors, such as money market funds, kept reducing their commercial paper holdings, including both US commercial paper and ECP. Based on Institutional Money Market Funds Association (IMMFA) data, the share of commercial paper holdings in the investment portfolios of AAA-rated money market funds declined to a record low of 26% in March 2009 and remained broadly unchanged in April 2009. Other investors also remained reluctant to buy short-term bank debt securities, preferring longer-term bank debt securities with more attractive pricing and often also with an explicit government guarantee. In response, affected banks had to resort to other sources of funding.

In summary, despite some signs of improvement, several sources of risk remained in the euro money market. First, with little turnover in longer-term unsecured markets and a preference for short maturities among the main liquidity providers, banks remained reliant on short-term funding in the unsecured market. Second, central bank liquidity facilities

1 Confirming this trend, the volume of outstanding repo transactions conducted in the Euro GC Pooling market, an electronic trading platform managed by Eurex Repo and offering CCP services, rose from €20 billion in January 2008 to €80 billion in April 2009.

2 At the end of April 2009, 52 Italian banks and Italian branches and subsidiaries of foreign banks were participating in the scheme, although participation was open to all EU banks, provided that the respective central banks enter into an agreement with the Banca d'Italia regarding the evaluation and the management of collateral.

3 The total outstanding ECP amounts provided by Dealogic were adjusted to exclude government and supranational issuers.

remained the most important source of liquidity for a number of banks, as indicated by the still large number of bidders in the Eurosystem's refinancing operations. Third, EURIBOR/OIS spreads remained elevated by historical standards and sensitive to adverse developments in broader credit markets and other money markets, in particular in the US dollar money market, given large US dollar liquidity needs by some euro area banks.

3.2 KEY DEVELOPMENTS IN CAPITAL MARKETS

GOVERNMENT BOND MARKETS

After the finalisation of the December 2008 FSR, further adverse changes in the macro-financial environment prompted monetary and fiscal policy measures that have contributed to the steepening of the euro area yield curve.

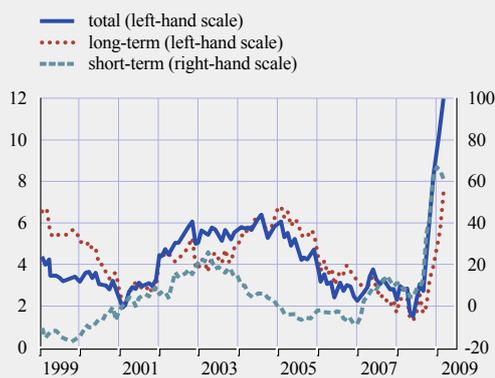
The rise in the term spread of AAA-rated euro area government bonds was mainly driven by the significant declines at the short end of the yield curve (see Chart S73), reflecting policy rate cuts as well as the impact of worsening economic conditions on short to medium-term interest rate expectations. At the long end of the yield curve, AAA-rated ten-year government bond yields in late May 2009 rose to levels above those observed in late November 2008.

Long-term yields already increased temporarily at the beginning of 2009 on account of increased market concerns about the fiscal sustainability risk of some euro area governments stemming from the agreed rescue and economic stimulus packages, as well as from the adverse effects of the deteriorating macroeconomic outlook. Thereafter, a gradual downward revision of sovereign risk since March 2009 has been counterbalanced by the upward pressure on bond yields stemming from the unwinding of previous flight-to-safety flows.

The net issuance of government debt securities increased markedly at the end of 2008 and the beginning of 2009 (see Chart 3.6). New debt issuance was mainly in the form of short-term

Chart 3.6 Annual growth of euro area governments' outstanding debt securities

(Jan. 1999 – Mar. 2009; percentage change per annum)



Source: ECB.

debt, partly because the steeper yield curve made short-term financing relatively cheaper. In March 2009 short-term debt accounted for more than 12% of the total amount outstanding, the highest share since the introduction of the euro in 1999.

Owing to continued uncertainty in government bond markets and despite a significant decrease from its November 2008 peak, in late May 2009 option-implied volatility remained at relatively elevated levels (see Chart S74).

The national rescue packages for the financial sector announced in October 2008 and thereafter were perceived by investors as a credit risk transfer from the private to the public sector. This induced a one-off effect, with credit default swap (CDS) spreads increasing and corporate financial CDS spreads coming down temporarily. Moreover, it resulted in a reduction in the sensitivity of financial firms' CDS spreads to further crisis-related deteriorations in their financial standing at the price of increased sensitivity of sovereign CDS spreads (see also Box 1 in Section 1.2).

During the first weeks of 2009, the differences in sovereign borrowing costs in the euro area became more pronounced. Investors increasingly discriminated between the debt securities of

different sovereign issuers by factoring in credit and liquidity considerations as well as hedging and collateralised borrowing possibilities.

This is illustrated by a continued widening of bond spreads relative to Germany and an increasing divergence of CDS spreads at the beginning of 2009. In addition, the correlation between some euro area government bond yields and those of Germany, which was generally strongly positive (close to one) before the onset of the turmoil, became much lower or even turned negative, confirming an increased decoupling of borrowing costs within the euro area government bond markets (see Chart 3.7).

The discrimination between issuers was particularly pronounced vis-à-vis countries that had experienced downgrades of their credit ratings or received credit warnings, countries with high debt levels and large commitments to support the financial sector relative to GDP, or countries where the financial sector was heavily exposed to economic developments in central and eastern European countries. At the same time, a narrowing of CDS and bond spreads since March 2009 indicated an improvement in investors' confidence in sovereign bond markets.

Looking ahead, the outlook for euro area government bonds is surrounded by persistent uncertainty regarding macro-financial developments. Upward risks for yields could be seen if flight-to-safety flows unwind further or if bond markets have difficulty in absorbing the increased issuance needs of euro area governments. This risk, however, may be dampened somewhat by the fact that many euro area governments had covered a substantial part of their expected financing needs for 2009 at the beginning of the year.

CREDIT MARKETS

After the finalisation of the December 2008 FSR, euro area credit markets remained under pressure, although some segments experienced an easing of tension thanks to improving market sentiment and anti-crisis measures by public authorities.

Debt security issuance

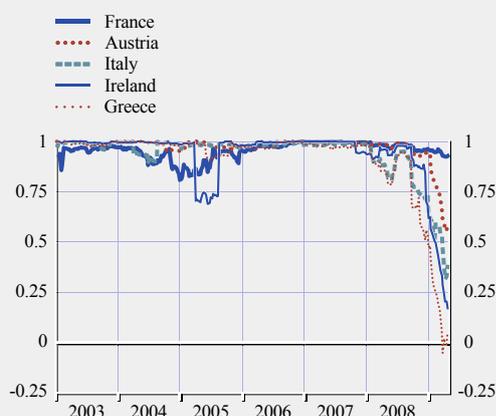
Early 2009 saw a substantial improvement in issuance of, and the demand for, investment-grade corporate bonds. By contrast, the demand for speculative-grade debt has generally remained subdued, with the exception of the marketable debt of some issuers from less cyclical sectors. The bulk of recent debt issues by financial companies has benefited from government guarantees.

As a result, total (gross) euro area non-financial corporate bond issuance rose to a record €103 billion in the first quarter of 2009, almost four times the volume for the first quarter of 2008 (see Chart 3.8), but consisted of predominantly investment-grade debt issues. Investors preferred to buy new issues in the primary market, rather than seasoned credit securities, because bid-ask spreads in the secondary market remained fairly high.

On the issuer side, three main factors boosted primary market activity. First, issuers had to clear a supply backlog after the market freeze in the autumn of 2008. Second, many companies were willing to reduce their dependence on increasingly expensive bank funding. Third, volatile market conditions and concerns about the economic

Chart 3.7 Correlation between weekly changes in German and other euro area government bond yields

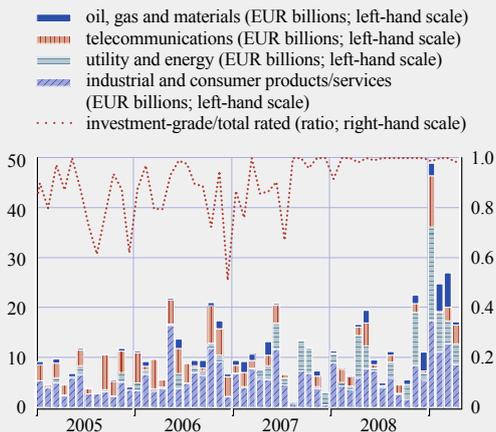
(Jan. 2003 – May 2009; Pearson's correlation coefficient; moving 20-week window)



Sources: Thomson Financial Datastream and ECB calculations.
Note: Correlations between ten-year German Bund yields (weekly changes) and respective euro area equivalents.

Chart 3.8 Corporate bond issuance in the euro area

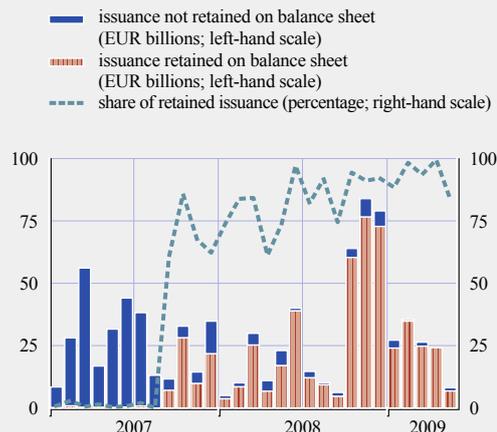
(Jan. 2005 – Apr. 2009)



Sources: Dealogic and ECB calculations.
Note: The investment-grade/total rated ratio is the ratio of the issuance of euro area investment-grade corporate bonds to total rated corporate bonds (euro area investment-grade plus speculative-grade bonds).

Chart 3.9 Asset-backed security issuance in the euro area

(Jan. 2007 – May 2009)



Source: Dealogic and ECB calculations.

outlook prompted many issuers to cover some of their future financing needs in advance.

On the investor side, interest in high-quality corporate bonds was supported by attractive yields. In addition, corporate bonds benefited from portfolio reallocation flows owing to the uncertain outlook for equity markets.

Almost two years after the start of the crisis, in late May 2009 the euro area asset-backed security (ABS) markets remained in a precarious state. Although issuance was taking place, the primary ABS markets were largely dysfunctional because most of the ABS deals continued to be retained on banks' balance sheets and used as collateral in refinancing operations with the Eurosystem (see Chart 3.9). Thus, securitisation continued to be used by banks as a source of liquidity, rather than as a funding instrument, because very few deals were actually placed with third parties.

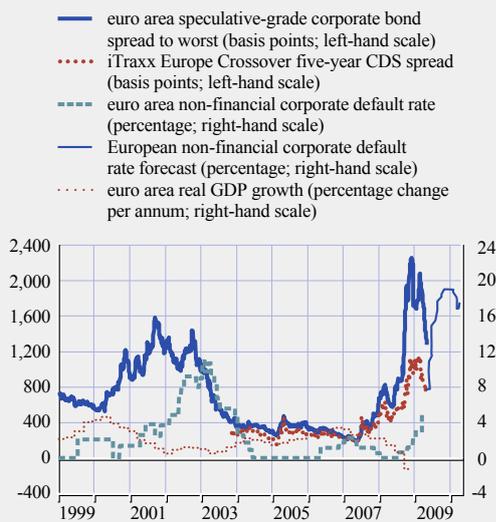
Volumes traded in the secondary ABS market were a small fraction of their pre-crisis levels. Several factors may explain the subdued

activity, including a significant change in investors' appetite for credit risk in view of the deteriorating macroeconomic conditions, uncertainty about valuations of ABS assets and investors' distrust of credit ratings. In combination with the involuntary accumulation of ABSs on banks' balance-sheets following the collapse of off-balance-sheet vehicles, all these factors kept securitisation market activity at very low levels (see also Box 2 on the restoration of securitisation activity in Section 1.2).

A revival of securitisation activity will probably coincide with an economic recovery and will also require both private and public sector initiatives. On account of the unexpectedly rapid deterioration of economic conditions in the euro area, the full recovery of the securitisation market may take some time (see Chart 3.10). Nevertheless, various guarantee programmes that are currently being implemented by euro area governments, which in some respects resemble the TALF and PPIP programmes introduced in the United States, may also prove successful in restarting securitisation activity.

Chart 3.10 Funding costs and macroeconomic conditions in the euro area

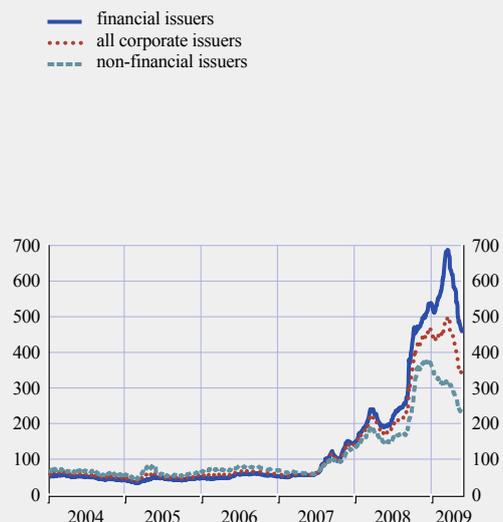
(Jan. 1999 – May 2010)



Sources: Eurostat, JPMorgan Chase & Co. and Moody's.

Chart 3.11 Average corporate bond spreads for financial and non-financial sector issuers in the euro area

(Jan. 2004 – May 2009; basis points)



Sources: Merrill Lynch and Bloomberg.
Note: Bonds with maturities of between five and ten years.

Covered bond markets also remained in a dysfunctional state, although the ECB announcement in early May 2009 on the covered bond purchase programme caused some revival of activity and primary issuance picked up. Until then, the primary markets had effectively been closed since autumn 2008 owing to increased risk aversion and competition with government-guaranteed bank bonds, which represented a relatively cheaper source of funding for banks. The issuance volumes during the first quarter of 2009, involving only a few euro area countries, were around 60% of those in 2008.

Credit spreads

In late May 2009, despite a pick-up in demand from institutional investors, high-grade corporate bond spreads remained very elevated (see Chart S81), reflecting continued high risk aversion and concerns about the worsening economic outlook. Speculative-grade corporate bond spreads, notwithstanding a sharp decrease after the turn of the year, also remained at very high levels (see Chart S82). Both these spreads and the respective CDS premia (see Chart S83) implied that market

participants expected a severe deterioration in credit performance, particularly among lower-rated firms. Furthermore, the significant increase in rating downgrades fuelled default fears and contributed to keeping spreads at elevated levels (see Chart S54).

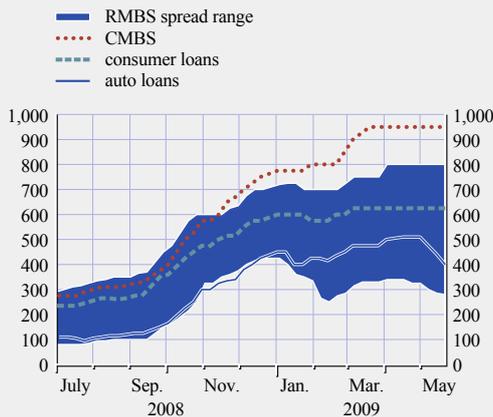
Increased discrimination across sectors resulted in a high dispersion of credit spreads, with CDS and corporate bond spreads much higher in the financial sector and other cyclical industries than in less growth-sensitive sectors (see Chart S85 and Chart 3.11).

Spreads on structured finance products (ABSs and covered bonds) also remained elevated. While retained ABS deals were priced off-market, often to relatively low levels, implied spreads from secondary markets were several times higher (see Chart 3.12). The latter have increased substantially during the last 12 months, despite some tightening at the beginning of 2009 and in May 2009.

In recent months, the overall functioning and liquidity of credit markets has been less than

Chart 3.12 European asset-backed security spreads in the secondary market

(July 2008 – May 2009; basis points)



Source: JPMorgan Chase & Co.

Notes: "RMBS" stands for "residential mortgage-backed securities"; "CMBS" stands for "commercial mortgage-backed securities". The RMBS spread range is the range of individual country index spreads on ABSs backed by residential mortgages in Greece, Ireland, Italy, the Netherlands, Portugal, Spain and the United Kingdom.

satisfactory. As an illustration, differences between CDS spreads and the asset swap spreads implied by bond prices, also known as the bond-CDS basis, have remained exceptionally wide (see Box 9). This is a clear example of inefficient pricing and could be due to the reduced availability of risk capital and leverage, both of which are typically needed to eliminate such arbitrage opportunities.

In the near term, it cannot be excluded that some credit markets might experience further bouts of

forced unwinding, entailing high volatility and abrupt asset price adjustments. In this context, some market participants have expressed concerns about the possibility of a large-scale unwinding of some collateralised loan obligations, as well as of funded and synthetic collateralised debt obligation structures.

Moreover, the credit spreads of most covered bonds, which were less strongly affected in the early stages of the turmoil, have widened significantly amid distressed sales and the uncertainty surrounding possible changes in associated credit rating methodologies. Such changes, if implemented, would result in lower credit ratings and would force rating-constrained investors (for example, insurance companies) to liquidate affected covered bonds. In addition, when deleveraging, banks and other investors preferred to sell covered bonds, rather than ABSs, since the former were more liquid. In order to help to improve market liquidity in this important segment of the private debt security market, in early May the ECB announced its intentions to purchase euro-denominated covered bonds issued in the euro area, which led to some tightening of covered bond spreads.

The outlook for credit markets remains complicated. Should uncertainty about near-term economic recovery prevail, corporate bond and CDS spreads are likely to remain high and volatile, thereby hindering the funding plans of financial and non-financial companies.

Box 9

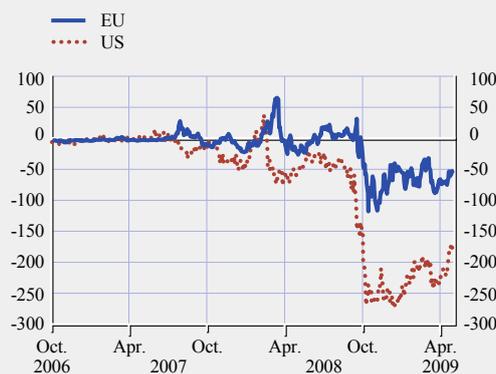
THE BOND-CDS BASIS AND THE FUNCTIONING OF THE CORPORATE BOND MARKET

Over the few months following the default of Lehman Brothers, conditions in the European corporate bond market deteriorated significantly. This box, after discussing the concept and the main drivers of the bond-CDS basis, examines why this measure may be a good indicator of overall conditions in the corporate bond market. In view of the persistence of the negative basis in the investment-grade segment of the market, the box also discusses the main reasons for the failure of arbitrage and its consequences for the investors that used basis-related investment strategies.

The pricing differential between a CDS spread and an asset swap spread implied by bond prices is called a bond-CDS basis. In normal times the basis tends to be positive and since the relative liquidity of the CDS and bond markets does not change significantly, CDS spread movements tend to lead bond spread movements.¹ However, sudden changes in the conditions in the cash market, mostly owing to a worsening of bond issuance conditions, an increase in funding costs or a larger deterioration in liquidity in the corporate bond market in relation to the CDS market, may cause the basis to suddenly enter negative territory. Thus, since a negative basis tends to be driven by shocks to the cash market, a negative bond-CDS basis may be a good indicator of overall credit conditions in the corporate bond market. In particular, sudden movements of the basis towards negative territory would be an indication of liquidity or funding shocks to the cash market.²

Investment-grade aggregate bond-CDS basis in the EU and the United States

(Oct. 2006 – May 2009; basis points)



Source: JPMorgan Chase & Co.

The chart shows that the basis abruptly turned negative following the default of Lehman Brothers in mid-September 2008. At that time, the corporate bond market experienced severe stress, whereby issuance conditions deteriorated significantly, funding costs increased markedly, as evidenced by the shift in the average investment-grade bond spread of 100 basis points, and liquidity in the secondary market dried up.

The widening of the difference between asset swap spreads implied by bond prices and CDS spreads encouraged some investors to enter into so-called “basis trades” in order to benefit from the expected convergence of the discrepancy between the prices of bonds and CDSs. There are several basis trade strategies, which are all based on the assumption that the underlying credit risks are similar and that arbitrage in an efficient market should eventually lead to a closing-up of the negative bond-CDS basis.

However, the negative basis in the investment-grade segment of the bond market proved to be persistent, which indicates that arbitrage opportunities could not be exploited by market participants (see Chart). There are several explanations for the persistence of the negative basis. First, an investor may face credit constraints owing to a worsening of funding conditions. Since banks and hedge funds, important potential investors, were under pressure to deleverage, they may have avoided such trades, which imply the use of leverage, whereby the investor borrows funds to buy the corporate bond and simultaneously to buy default protection on the underlying

1 See R. Blanco, S. Brennan and I. W. Marsh, “An empirical analysis of the dynamic relation between investment-grade bonds and credit default swaps”, *Journal of Finance*, 60 (5), October 2005.

2 Some recent studies by ECB staff on the relationship between CDS spreads and bond spreads for euro area banks suggest that the outbreak of the financial turmoil in the summer of 2007 induced a substantial increase in risk aversion and a shift in the pricing of credit risk, with CDS markets becoming more sensitive to systematic risk while cash bond markets priced in more information about liquidity and idiosyncratic risk. The long-run relationship between the two spreads holds; however, a significant change in the lead-lag relationship has been identified. For more details, see I. Alexopoulou, M. Andersson, O. M. Georgescu, “An empirical study on the decoupling movements between corporate bond and CDS spreads”, *ECB Working Paper*, forthcoming.

bond in the CDS market. Second, there is a non-negligible risk of marking-to-market losses. If the basis shifts further into negative territory after an investor has entered into the basis trade, this implies that unrealised losses from such an investment have to be booked on investors' profit and loss accounts. Since movements in the basis were substantial and volatile, this may have initiated internal stop-losses set by investors. Third, since bonds and CDSs are not perfect substitutes, there may be a minor risk of suffering losses from the trade as a result of the materialisation of risks embedded in one product but not existing in another. In an environment of extreme risk aversion, investors may avoid taking these risks and would not exploit opportunities of such approximate arbitrage. Fourth, low liquidity in one or both markets may boost bid-ask spreads to levels that would make arbitrage opportunities less profitable than they appear.

Market intelligence suggests that the first two reasons were the most significant factors behind the persistence of the basis. Moreover, some banks may have made losses owing to the persistence of the negative basis.

EQUITY MARKETS

After the publication of the December 2008 FSR, euro area equity markets continued to decline amid worsening economic conditions, high levels of risk aversion (see Charts S75 and S18) and difficulties faced by financial firms, especially banks. However, supported by increased market confidence, stock indices, and bank stocks in particular, rebounded after mid-March 2009. By late May 2009, the broad euro area equity index recovered to the levels recorded in late November 2008.

At the beginning of 2009, stock market uncertainty, as measured by the implied volatility derived from stock option prices, increased owing to further downward revisions of economic growth and renewed concerns about the banking sector (see Chart S76). However, in March 2009 implied volatility started to decline and has dropped markedly since then, but it still stood at relatively high levels in late May 2009. Looking ahead, it is unlikely that volatility, which is an important pricing component for many derivatives contracts, including options and CDS contracts, will decline substantially further until concerns about the macro-financial environment start to abate.

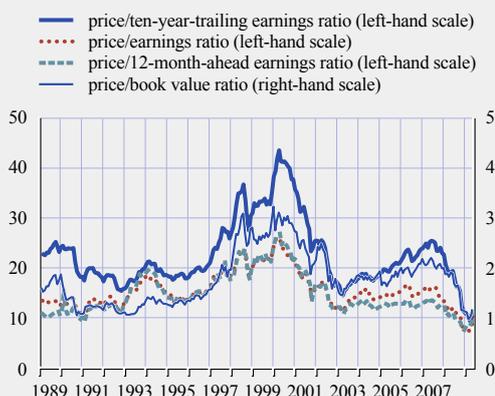
Net flows into equity investment funds focusing on euro area equities, despite some improvement, still remained negative in the first quarter of 2009, thereby further extending a

prolonged period of such outflows. A reversal of these flows might act as an important stabilising factor for equity prices.

In early 2009 various stock price valuation measures, such as the price/earnings (P/E) ratio based on ten-year-trailing or 12-month-ahead earnings expectations reached their lowest value since the beginning of the series in 1982 and 1987 respectively (see Chart 3.13). Other equity valuation ratios, including the price/cash flow from operations (P/C) and price/book value (P/B) ratios for euro area stocks, tell a similar story. The P/B ratio of all

Chart 3.13 Equity valuation ratios for the euro area

(Jan. 1989 – May 2009; ratio)



Sources: Thomson Financial Datastream and ECB calculations.

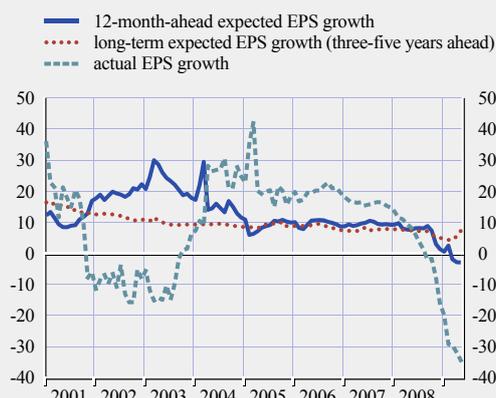
listed companies in the euro area declined to below one in February 2009, and even to around 0.5 for financial firms.

However, actual levels of earnings per share of euro area companies listed in the Dow Jones EURO STOXX index and their expected 12-month growth rates continued to decrease (see Chart 3.14), thereby having a negative effect on investor sentiment. Nevertheless, expected longer-term earnings growth rates started to increase after March 2009, thus suggesting some improvement in investor expectations.

Elevated option-implied equity index volatilities (also over one and two-year periods) suggested persistent uncertainty among investors and expectations that stock prices would remain volatile in the period ahead. While generally low valuation ratios and improved market confidence provided some indication that prices might already have bottomed out, estimates of

Chart 3.14 Realised and expected earnings per share (EPS) for the Dow Jones EURO STOXX index

(Jan. 2001 – May 2009; percentage change per annum)



Sources: Thomson Financial Datastream and ECB calculations.

earnings per share might still surprise on the negative side and turn out to be lower than expected by market participants.

Box 10

THE IMPACT OF SHORT-SELLING RESTRICTIONS ON EQUITY MARKETS

“Short-selling” refers to the practice of selling shares without owning them, hoping to buy them at a lower price at a later point in time, thus making a profit. If the shares are borrowed, the practice is called “covered” short-selling. “Naked” short-selling is the practice of selling stock without having a lending party, hoping to find one later. Until the current global financial crisis, authorities and academic literature tended to hold the view that short-selling plays a positive role in financial markets in the long run. Short-selling is seen to result in more efficient pricing, to decrease volatility and increase liquidity, and to improve possibilities for hedging and risk management.¹

In mid-September 2008 regulatory authorities around the world adopted a series of restrictions on the short-selling of financial equity stocks. The common objective of these measures was to restore confidence in the middle of the global financial turmoil. On 18 September 2008 the UK Financial Services Authority (FSA) blocked covered short sales of 34 financial stocks and strictly enforced the requirement that stocks must be borrowed prior to a short sale (preventing naked short-selling). In addition, to increase transparency, the FSA introduced rules requiring the disclosure of short positions that exceeded a certain threshold of a company’s stock. The US Securities and Exchange Commission (SEC) adopted similar measures and blocked the

¹ See E. M. Miller, “Risk, Uncertainty, and Divergence of Opinion”, *Journal of Finance*, 32 (4), 1977; and R. Jarrow, “Heterogeneous Expectations, Restrictions on Short Sales, and Equilibrium Asset Prices”, *Journal of Finance*, 35 (5), 1980.

temporarily covered short sales of 799 financial stocks on the following day.² Following the SEC and the FSA, European regulators introduced rules prohibiting mainly the naked short-selling of financial shares.³

Some evidence of a resulting decline in market efficiency for the affected stocks in the United Kingdom and the United States has been documented. For the US stock market, Bris documented the fact that market quality and stock liquidity declined as investors found it increasingly difficult to hedge market risks.⁴ For the UK stock market, Clifton and Snape noted that bid-ask spreads increased significantly for the banned financial equity stocks and registered a dramatic decline in volume and turnover.⁵ For the German stock market, this box examines how the short-selling restrictions introduced by the BaFin, the federal financial supervisory authority, on 22 September 2008 affected the behaviour of stock prices of financial companies.⁶ Specifically, the BaFin prohibited naked short-selling transactions in specified shares of 11 financial companies.

Investors can replicate the price behaviour of stocks in the options markets by simultaneously taking long and short positions in puts and calls and lending cash. This box assesses whether the prices of these synthetic stocks were lower where restrictions on short sales made it difficult or expensive to short-sell the stock itself.⁷ The analysis focuses on tick data trades for 11 major European financial companies traded on the Deutsche Börse over the period from July 2007 to November 2008. The dataset includes four of the 11 financial companies subject to the BaFin's restriction.⁸ Using short-term at-the-money call and put options with the same strike and expiration, 24,846 sets of trades were selected to generate synthetic stock prices. The sample is split on 22 September 2008, when restrictions on naked short-selling were introduced, creating a pre-event and a post-event sample. 22,354 sets of trades are contained in the pre-event sample and 2,492 in the post-event sample. Attention is restricted to cases that seem to promise profits: the number of times the stock price is higher (lower) than the synthetic price by more than 2% is counted. As expected, in the large majority of cases, there are no arbitrage opportunities. There are (i) 740 pre-event cases and 29 post-event cases in which it appears that an investor could buy synthetically in the options market and sell at a higher price in the stock market (Category 1); and (ii) 33 pre-event cases and 17 post-event cases in which it appears that investors could buy in the stock market and sell synthetically at a higher price in the options market (Category 2). The number of apparent arbitrage opportunities of Category 1 is higher than that of Category 2. One explanation why arbitrage opportunities of both categories could not be exploited could be that it was impossible or too expensive in these specific cases to sell the stock. However, a substantial

2 The SEC ban expired on 2 October 2008 and the FSA ban on 16 January 2009.

3 Moreover, most European regulators made it obligatory for financial institutions to abstain from lending the shares concerned, therefore prohibiting covered short sales, except where this is needed to cover an existing position, perform an obligation contracted prior to the coming into force of the rule or where a transaction has no link with a short economic position.

4 See A. Bris, "Shorting Financial Stocks Should Resume", *Wall Street Journal*, 29 September 2008.

5 See M. Clifton and M. Snape, "The Effect of Short-selling Restrictions on Liquidity: Evidence from the London Stock Exchange", *London Stock Exchange Policy Note*, 19 December 2008.

6 On 30 March 2009 the BaFin extended its ban on certain short-selling transactions to 31 May 2009.

7 In the literature, the same type of analysis was conducted to examine whether difficulties in short-selling internet stocks during the growth of internet stock prices over the period 1998-2000 meant that the prices of such stocks reflected the beliefs of optimistic investors only. See R. Battalio and P. Schultz, "Options and the Bubble", *Journal of Finance*, 61, 2006; E. Ofek and M. Richardson, "DotCom Mania: The Rise and Fall of Internet Stock Prices", *Journal of Finance*, 58, 2003; E. Ofek, M. Richardson and R. Whitelaw, "Limited Arbitrage and Short Sales Restrictions: Evidence from the Options Market", *Journal of Financial Economics*, 74, 2004; and O. Lamont and R. Thaler, "Can the Market Add and Subtract? Mispricing in Tech Stock Carve-outs", *Journal of Political Economy*, 111, 2003.

8 Specifically, the four financial companies are Commerzbank, Deutsche Bank, Deutsche Postbank and Hypo Real Estate Holding. The other financial companies are BNP Paribas, Credit Suisse, Credite Agricole, Fortis, UBS, Unicredito Italiano and Société Générale.

proportion of these opportunities belong to the pre-event sample. Finally, the analysis reveals that the introduction of restrictions on naked short-selling did not affect the stock and option prices of the financial companies subject to the ban with respect to the pre-event sample.

Conclusions on the impact of short-selling restrictions on the market are mixed. In fact, adverse consequences for liquidity in a given bank stock and its derivatives were minimal in the German market, but severe in the markets in the United States and the United Kingdom. A plausible explanation is that the different types of restriction introduced by financial authorities affected market efficiency to different degrees. In Germany, a ban on naked short-selling of specific financial stocks was introduced, while covered short-selling was prohibited in the United Kingdom and the United States. Prohibiting naked short-selling may make the practice of short-selling more costly, but it is generally a less severe restriction than prohibiting covered short-selling. In fact, a ban on naked short-selling does not exclude the participation of potential sellers, who may have bearish views on a stock. This restriction does not reduce transactions in the stock market, which in turn does not delay price discovery and curtail liquidity.