

## Box II

### ASSESSING THE IMPACT OF RECENT MARKET TURMOIL ON EURO AREA LARGE AND COMPLEX BANKING GROUPS: A STRESS TEST OF POTENTIAL BALANCE SHEET EXPANSION

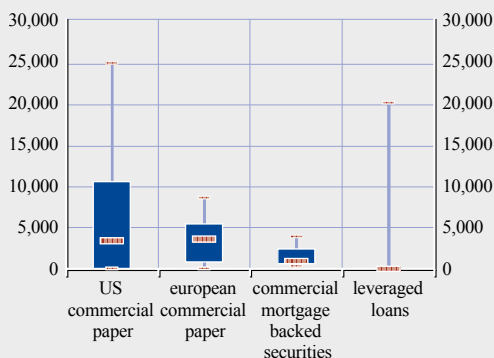
The credit market turmoil that erupted in late July and early August 2007 is likely to have negative implications for the funding requirements, earnings and even capital ratios of several euro area LCBGs. The turbulence, which had its origins in a loss of confidence in assets that are backed by mortgage loans extended to US sub-prime borrowers, triggered contingent credit lines to be drawn on some LCBGs to fund off-balance sheet vehicles, after these vehicles were no longer able to roll over their short-term funding in the asset-backed commercial paper (ABCP) market. The loss of confidence also contributed to market liquidity problems across a wide range of related securitisation activities. As a consequence, several LCBGs endured a crystallisation of warehousing risks on household and corporate loans – some of which are extended to finance leveraged buy-out (LBO) transactions – which they were not intending to hold on their balance sheets.

The size of the off-balance sheet ABCP programmes and LBO warehousing exposures of individual LCBGs was, in some cases, relatively large relative to their total equity. After the initial shock to the credit market, which was amplified by the failure of two mid-sized European banks that had large exposures in the ABCP market, other banks with illiquid off-balance sheet vehicles or large loan warehouses gradually started to either sell some of the assets in these vehicles, or to take them back onto their own balance sheets. This process of re-intermediation prompted some banks to hoard liquidity for precautionary reasons which ultimately had a marked negative impact on the ability and willingness of banks to lend to each other.

When liquidity commitments provided by banks to off-balance sheet vehicles are drawn on, either the loans or the underlying assets will flow back onto the bank's balance sheet. In the latter case, the assets are valued according to the relevant risk weights. Such flows back onto balance sheets tend to boost banks' risk-weighted assets and reduce their capital ratios. The increase in risk-weighted assets also means that banks have to obtain additional funding to finance the balance sheet expansion. Among the 21 euro area LCBGs, publicly available information in early November 2007 showed that 18 of them had exposures to ABCP programmes and 9 to leveraged loan warehousing risks. The bulk of the exposures are to US commercial paper (see Chart A). When converted into balance sheet exposures using a 100% risk weight, in aggregate these exposures correspond to an additional funding requirement for these banks of approximately € 244 billion. This represents 5.2% of total loans outstanding of these LCBGs, or 10.4% of their deposit base. The median funding requirement of these requirements is around € 11.1 billion, corresponding to ratios of 6.0% and 9.1% relative to loans and deposits, respectively (see Chart B).

**Chart A Estimated exposures of selected euro area large and complex banking groups to selected asset classes**

(EUR millions; maximum, minimum, interquartile distribution and median)

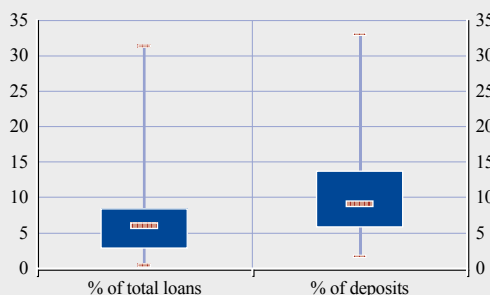


Sources: Bankscope, Dealogic, Fitch Ratings, Morgan Stanley and ECB calculations.

Note: The chart shows the distribution of exposures over those LCBGs that have been identified of having exposures to the various assets. Minimum and maximum refer to the individual institutions with lowest and highest changes in the sample.

**Chart B Estimated additional funding needs of selected euro area large and complex banking groups**

(% of total loans and deposits; maximum, minimum, interquartile distribution and median)



Sources: Bankscope, Dealogic, Fitch Ratings, Morgan Stanley and ECB calculations.

Note: The chart shows the distribution of the estimated additional funding needs should all assets in Chart A be taken onto balance sheets. Minimum and maximum refer to the individual institutions with lowest and highest ratios in the sample.

The scale of this additional funding need is likely to adversely affect these institutions' earnings prospects going forward.<sup>1</sup>

In order to gauge the potential scale of the risks to capital ratios of euro area LCBGs in a scenario where these exposures are fully taken back to the balance sheets of the sponsoring banks, a stress test was carried out. In the stress test, it was assumed that the maturity of the ABCP programmes is below one year. In addition, in the first scenario it was assumed that all assets to be taken onto the balance sheets (including leveraged loans) would retain their high – typically AA to AAA – credit ratings.<sup>2</sup> In the second scenario, it was assumed that the assets to be absorbed onto the balance sheets are also downgraded to BB+ rating category, in which case a higher risk weight is to be applied. No second round effects were incorporated, which is an important limitation of the stress test.

The results from the first stress scenario show that the median declines in the total capital and Tier 1 ratios of euro area LCBGs are rather limited – falling between 12 and 8 basis points (see Chart C). However, a few LCBGs with large exposures to off-balance sheet vehicles and/or LBO warehousing risks would see their capital ratios falling by substantially more. Regarding the levels of the capital ratios, none of the LCBGs would actually see their ratios fall below the regulatory-required minima as a direct result of the stress test, either in terms of total capital (8%) or Tier 1 capital (4%) (see Chart D). This suggests that the LCBGs with the largest exposures to off-balance sheet vehicles and loan warehousing risks often have very strong capital bases, which enhances their ability to withstand shocks to risk-weighted assets.

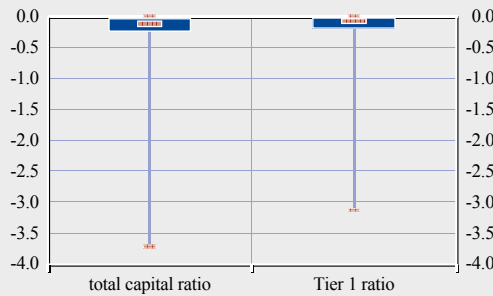
Under the second more severe stress scenario, where assets are also downgraded, the median declines in both total capital and Tier 1 capital ratios decline by around 20 basis points in both

<sup>1</sup> This box only examines sources of potential one-off changes in bank capital. A more in-depth analysis of the factors that drive bank capital is provided in Special Feature A of this FSR.

<sup>2</sup> This scenario is roughly similar to the one conducted in Moody's (2007), "Global banking: update on Moody's perspective on the credit markets and the impact for ratings of banks globally", September.

**Chart C Distribution of changes in capital ratios of euro area large and complex banking groups as a result of balance sheet stress, Scenario I**

(%; maximum, minimum, interquartile distribution and median)

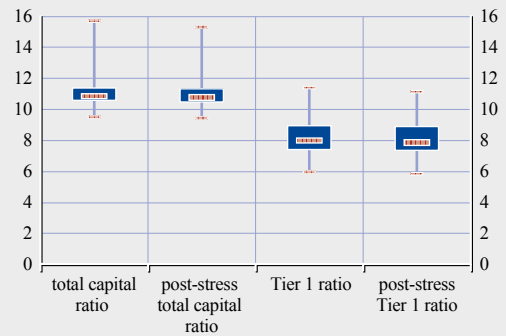


Sources: Bankscope, Dealogic, Fitch, Morgan Stanley and ECB calculations.

Note: The chart shows the percentage reduction in total capital and Tier 1 capital ratios as a result of a stress test where it is assumed that no downgrades of assets take place. Minimum and maximum refer to the individual institutions with lowest and highest changes in the sample.

**Chart D Distribution of capital ratio levels of euro area large and complex banking groups before and after stress, Scenario I**

(%; maximum, minimum, interquartile distribution and median)



Sources: Bankscope, Dealogic, Fitch, Morgan Stanley and ECB calculations.

Note: The chart shows the levels of total capital and Tier 1 capital ratios before and after a stress test where it is assumed that no downgrades of assets take place. Minimum and maximum refer to the individual institutions with lowest and highest ratios in the sample.

cases. In terms of levels, even the institutions that are worst hit by the stress event still remain above the regulatory solvency ratios.

Although the results of these stylised scenarios suggest that euro area LCBGs could be sufficiently well capitalised to weather the stresses their balance sheets would face in the event that a re-intermediation process were to take place, it is very important to point out the limitations of the tests carried out. Indeed, a lengthy process of re-intermediation could absorb a substantial amount of banks' funds and impose limitations on their ability to lend. Should an eroded capacity to lend lead to a credit crunch in the wider economy, as a second round effect banks would then most likely face a deterioration in their asset quality. In addition, the earnings of LCBGs are likely to be negatively affected by the credit market turmoil for several reasons, including through a lowering of revenues from new loan origination and securitisation activities, which could have an adverse impact on future capital ratios due to lowered retained earnings and reduced share buy-back activity. Because many LCBGs target some particular capital ratio above the regulatory minima in the pursuit of higher credit ratings, deteriorating capital ratios could also have adverse consequences for their credit quality and future funding costs. Finally, assuming that the LCBGs covered in this analysis would pay out full dividends in line with the policies they have pursued in past years, this would put additional strain on their capital ratios. Against this background, it cannot be excluded that some of the affected institutions might have either to alter their dividend policies for the year 2007 or replenish their capital bases through other means.