

### Box 3

#### THE RECENT REPRICING OF CREDIT RISK

What started in mid-June as intensified concerns about losses in the US sub-prime mortgage market later developed into widespread financial tensions, bringing about a general reassessment of financial market risks (in particular credit and liquidity risk) and a reduced appetite for risk among investors across the globe. The general repricing of credit risk can be gauged by developments in the corporate bond and credit derivatives markets, where spreads have widened markedly across the whole rating spectrum (see Chart 14 in the main text). The general character of the repricing of credit risk notwithstanding, the financial tensions have affected financial institutions more than non-financial corporations. This box provides some evidence on the differences between financial and non-financial corporations in the euro area as regards the impact of the turmoil. It also assesses the recent repricing of credit risk, mainly in the non-financial corporate sector, from the perspective of an econometric model based on BBB-rated bonds as a representative example.

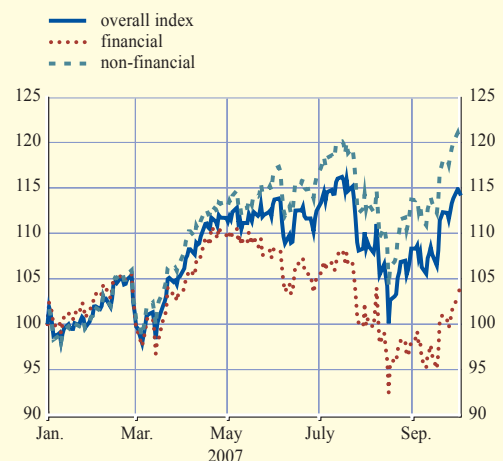
#### Developments in non-financial and financial corporate bond spreads

Corporate bond spreads for most of 2005 and 2006 were in a tightening trend, albeit with some small interruptions in the spring of both years. The extremely low levels reached by credit spreads at the lower end of the rating spectrum in particular were one manifestation of the general environment of unusually low pricing and perceptions of both financial and economic risks. However, between the end of June and 2 October 2007 bond spreads for BBB-rated non-financial corporations increased by around 40 basis points to stand at 100 basis points. For the same rating class, spreads for financial corporations increased by almost 90 basis points over the same period to stand at a level of 195 basis points. A similar message emerges from sectoral stock prices, with the financial sector recording losses of 1.5% over that period, while the broad market index increased by around 2% (see Chart A). The stock price index for the non-financial sector increased by around 3.5%.

The underperformance of the financial sector reflects the changes in market participants' perceptions of the credit risk faced by financial institutions (including banks). This reflects the fact that financial institutions have the greatest exposure to those market segments which are at the epicentre of the turmoil, namely asset-backed securities and structured finance in general. These have suffered the most from declines in asset values and the drying up of market liquidity and activity. Market perceptions of the earnings and credit outlook for financial corporations have therefore deteriorated in the face of these difficulties.

Chart A Sectoral stock prices in the euro area

(1 January 2007 = 100)



Sources: Thomson Financial Datastream and ECB calculations.

### An econometric model explaining corporate bond spreads

In order to gauge the extent to which corporate bond spreads might have been mispriced before and after the outbreak of the turmoil, one needs a “benchmark” that links credit spreads to corporate bond determinants. To this end, this box reports results from an econometric model based on the cointegration methodology, which explain BBB-rated corporate bond spreads in the euro area using a few variables representing factors suggested in the literature.<sup>1,2</sup>

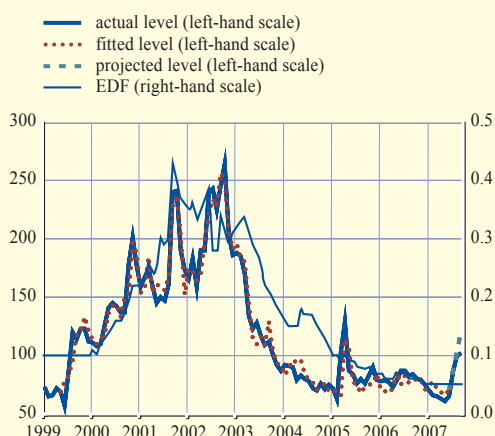
The model suggests that corporate bond spreads share a long-term equilibrium relationship with several explanatory variables intended to capture, directly or indirectly, changes in default risk, the business and interest rate cycles, and the market’s perceptions of financial risks. More precisely, the model incorporates expected default frequencies (Moody’s KMV EDFs), the business sentiment indicator Ifo, the three-month EURIBOR and implied stock market volatility as measured by the VSTOXX index. Evidencing this long-term equilibrium relationship, the one-month lagged equilibrium error drives current changes in corporate bond spreads in a statistically and economically significant manner, such that the equilibrium error tends to correct itself over time.

1 See, for example, Merton, R. C. (1974), “On the pricing of corporate debt: the risk structure of interest rates”, *Journal of Finance* 29, 449-470; and Collin-Dufresne, P., R. Goldstein and S. Martin (2001), “The determinants of credit spread changes”, *Journal of Finance* 56, 2177-2207.

2 Credit spreads are measured as the yield differential between the Merrill Lynch yield index for financial and non-financial bonds and comparable government bond yields. Monthly credit spread changes are constructed at the end of the month, when the indices are rebalanced in the event that a company has left or joined the index. Option-adjusted spreads (OASs) are used. The OAS is a measure of the amount of optionality priced into a callable or puttable bond. These spreads are purged of any embedded options, coupon effects or index rebalancing effects.

**Chart B Actual and fitted values for the spreads of BBB-rated non-financial corporate bonds**

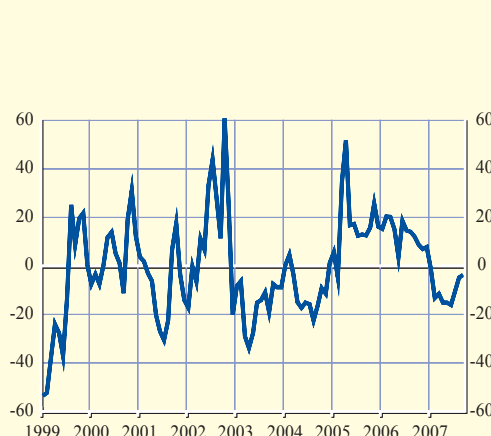
(end-of-month data; spreads in basis points and EDFs in percentages)



Sources: Bloomberg and ECB calculations.  
Note: The last three observations for the fitted level refer to the conditional forecasted values for the last three months of the sample (July to September 2007).

**Chart C Error correction term from the long-term relationship for the spreads of BBB-rated non-financial corporate bonds**

(end-of-month data; basis points)



Source: ECB calculations.

Chart B plots the actual BBB-rated bond spread for non-financial corporations together with the fitted values from the full error-correction model, in which these values are shown only up until June 2007, the last month for which the default data are available. For the period July to September the chart also shows projected spread levels, assuming that the expected default frequency rate subsequently remains at its June level. As judged by the model fit, the four determinants tend to explain the corporate bond spreads relatively well.

The recent turmoil has caused a marked increase in the corporate bond spread, to levels more in line with their average levels observed since 1999. However, the fact that this spread increase can, to a large extent, be captured by the model seems to suggest that it may be part of a general correction or “normalisation” of credit spreads following the historically low levels observed in 2006. In particular, the model suggests that in the first half of 2007 the spread for non-financial corporations was lower – although only modestly so – than could be expected on the basis of its determinants (see again Chart B). The same message is presented in Chart C, which shows the long-run equilibrium relationship between the spread and its determinants. However, it should be noted that, according to the model, the recent spread widening mainly reflected the significant increases in stock market volatility and the short-term interest rate. The proxy for economic activity, the Ifo, played only a minor role in the spread increase, and there is no evidence thus far that default rates increased from their extremely low levels, which might also reflect previous conditions of ample credit availability. Hence, unless corporate bond defaults also correct upwards towards historical averages some time in the future in a maturing credit cycle, the observed correction in the BBB-spread for non-financial corporate bonds might not be fully sustained if the turmoil were to abate, with stock market volatility and money market rates declining accordingly.

In principle, the same pattern of behaviour and interpretations also applies to the spreads for financial corporations. This notwithstanding, corporate bond spreads for the financial sector seem to have overshot in a more significant manner the values suggested by a similar econometric model. This could reflect higher premia being demanded by investors on the basis of the high level of uncertainty surrounding the soundness of the sector. Alternatively, the overshooting could also reflect an overreaction by investors, which could unwind in the absence of further adverse shocks to market sentiment.

All in all, the findings of the econometric models seem to suggest that the recent widening of credit spreads mainly reflects a correction of the compensation required for anticipated financial rather than macroeconomic risks. Moreover, the increases in corporate bond spreads for non-financial corporations are more moderate and broadly consistent with a “normalisation” of spreads from the historical low levels reached previously. By contrast, the increases in spreads for financial entities have been stronger and could reflect a more pessimistic view on the part of investors regarding profitability in the overall financial sector in the context of the current prevailing market tensions. As the models rely on data collected for the period after the introduction of the euro in January 1999, they are estimated on the basis of a rather small sample and may, therefore, be subject to some instability and uncertainty. Caution is therefore warranted when interpreting the results derived from these models.