

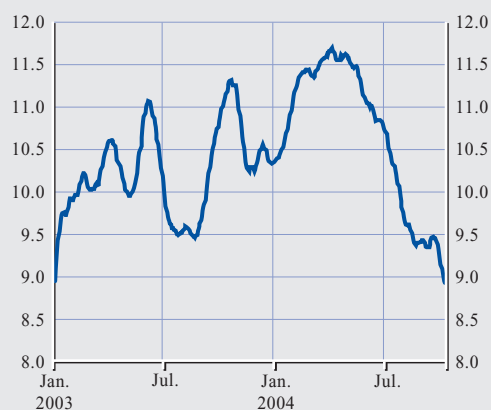
Box 3 Factors underlying recent declines in implied volatilities across financial markets

Notable declines in the volatilities implied in option prices to relatively low levels took place across a wide range of financial markets after spring 2004 (see Charts B.3.1 and 2). Implied volatility is often used to gauge the degree of uncertainty prevailing in markets, and can provide information on expectations of future financial market stability. Theoretically, implied volatility in bond and equity markets should tend to rise when a business cycle expansion moves into a mature phase, as uncertainty begins to increase about the necessity for monetary policy tightening. Moreover, the onset of rising interest rates typically leads to higher volatility as uncertainty about the future trajectory of interest rates increases. Foreign exchange volatility can be affected if business and interest rate cycles are desynchronised. The future market quiescence implied in the recent pricing of options has been remarkable, given indications of a maturing of the global economic upturn, coupled with rising interest rates, the surge in oil prices, persistently wide global imbalances and ongoing geopolitical uncertainties. This Box assesses some of the factors that appear to have played a role in driving implied volatility lower.

Three fundamental factors appear to explain the general decline in implied volatilities across different financial markets. First, recent patterns may have reflected the continuation of a period

Chart B3.1 One-month at-the-money EUR/USD implied volatility

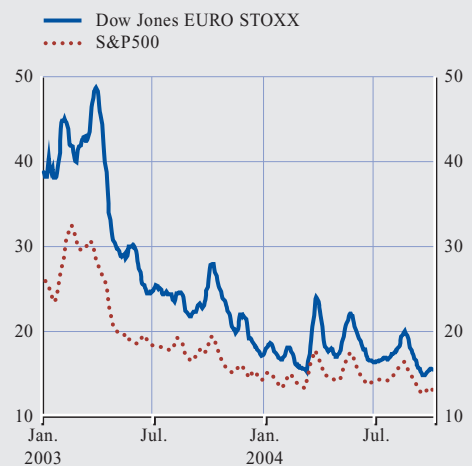
(20-day moving average, %)



Source: Bloomberg.

Chart B3.2 Implied volatility on the Dow Jones EURO STOXX and the S&P 500

(ten-day moving average, %)



Source: Bloomberg.

of normalisation following several financial market shocks, beginning with the Asian and Russian crises of 1997/1998 and followed by the subsequent collapse of LTCM, the bursting of the IT stock market bubble, several corporate accounting scandals, growing international terrorism, the war in Iraq and fears of deflation (see Chart B3.3). Second, improving global macroeconomic conditions together with low inflation also appear to have played a role. Third, there appears to be a general perception among market participants that the communication of monetary policy intentions has improved globally, thereby reducing fears of monetary policy surprises.

Apart from fundamental factors, there may also be some technical aspects that lie behind the decline in implied volatility, particularly in equity markets. Substantial growth in the market for collateralised debt obligations (CDOs) – which are essentially debt security instruments that are backed by a diversified loan or bond portfolio – has opened up possibilities for hedging positions in corporate bonds and it appears to have played some role in the compression of spreads in the underlying markets. There is potential for interplay in the pricing of implied volatility and credit spreads that arises from arbitrage. Low implied equity market volatility should, all else being equal, be associated with tighter credit spreads so that credit spread compression and the decline of volatility could have served to reinforce one another as part of an arbitrage process via CDO markets. Although other factors may have played a role, one possible indication of greater hedging of CDO exposures through equity options markets has been a significant increase in the amount of equity options outstanding on organised exchanges. Open interest (i.e. the total number of option contracts that have not yet been exercised, expired, or fulfilled by delivery) in equity index options increased substantially during 2004. In the first three quarters of the year, it rose by almost 50% for the S&P 500 and by almost 40% for the Dow Jones EURO STOXX 50 compared with the same period in 2003 (see Charts S15 and S30). Hence, the decline in implied volatility may, to some extent, be a manifestation in another guise of the hunt for yield that characterised financial markets through much of 2003 and 2004.

From a financial stability viewpoint, the possibility that technical factors may have led to a mispricing of implied volatility in stock markets could have several implications. First, to the extent that it has underpinned a trend of rising leveraged credit investment, it may have left

Chart B3.3 Implied volatility (VIX) on the S&P 500



Source: Bloomberg.

CDO markets vulnerable to shocks – including possibly unpredictable and disorderly market dynamics. Second, if it has contributed to the lowering of volatility in the underlying markets, it may have encouraged excessive risk-taking by financial institutions. For instance, it cannot be excluded that institutions that have set aside risk capital based on VaR approaches, which includes some euro area banks, may find that they have set aside insufficient amounts for seemingly low risk positions that could quickly become highly volatile in the event of an unexpected market disturbance. Third, if actual volatility were to rise suddenly, option sellers could face unexpected losses, especially if their risk management systems prove to be inadequate.