Box 2

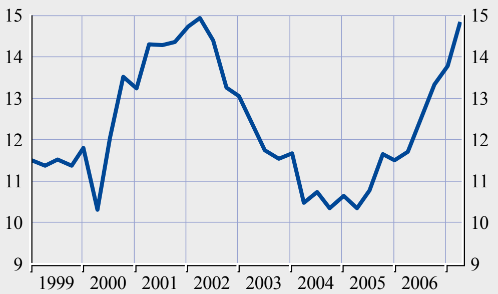
CAUSES AND CONSEQUENCES OF THE RECENT MARKET TURMOIL

The recent turmoil in financial markets had its origins in a sharp re-pricing of credit risk following growing creditworthiness problems in the US sub-prime mortgage market. This led to concerns about the nature and extent of financial institutions' exposures to sub-prime mortgages both direct and indirect via structured credit products. Notwithstanding the fact that financial market participants judged most of the affected institutions as having an ability to cope with the potential losses, the uncertainty surrounding the dispersion of these losses and the lack of transparency as to the magnitude of the risks faced by financial institutions triggered a loss of risk appetite. Higher risk aversion spread to several other asset markets and it led to disruptions in some money market segments. The fact that markets were unprepared and had underpriced the risks of these events was reflected in very tight credit spreads and low implied volatilities across a range of markets. This box recalls some of the major triggering events behind the market turmoil and it assesses the consequences.

Delinquency rates on sub-prime mortgages started to pick up in the US as early as 2005 (see Chart A), as higher interest rates and a slowdown of house price inflation made it more difficult for some borrowers to meet their financial obligations. At the same time, and notwithstanding deteriorating fundamentals, intense competition between lenders for market share in the sub-prime mortgage market apparently led to an undue relaxation of credit standards and excessive risk-taking by some lenders. Indicators of financial market risk showed that market participants perceived

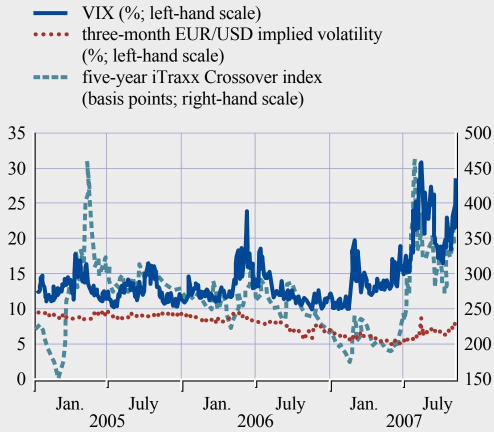
Chart A US sub-prime loan delinquencies

(% of total sub-prime loans)



Sources: Mortgage Bankers Association and Bloomberg.

Chart B Market indicators of risk



Source: Bloomberg.
Note: The VIX index shows implied volatility for the S&P 500 index.

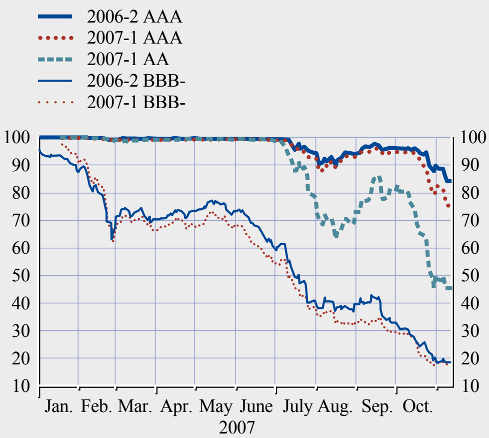
the likelihood of high market volatility as being rather low, at least until the end of February 2007 (see Chart B). For instance, implied volatility for major equity indices and currency pairs stood at near record-low levels, while credit spreads were very tight, despite widespread warnings by the global central bank community that markets appeared to be generally "underpricing risk" and that a normalisation in the pricing of risk seemed unavoidable at some point.

By the end of February 2007, market fears were growing about the financial impact of the deterioration of creditworthiness in the US sub-prime mortgage market and the implications for banks. This together with concerns about the underpricing of risk triggered a correction across markets which, however, was relatively small in scale and proved to be short-lived with risk appetite recovering sharply shortly afterwards. Nevertheless, some market indicators showed that at least some market participants remained concerned about the possible ultimate impact of losses related to sub-prime lending. For instance, implied volatility in equity markets did not return to the levels seen before the February 2007 hiccup, as equity managers reinforced the hedging of their portfolios. This probably helped limit the scale of the turmoil that erupted in the summer of 2007 in some market segments (in particular equity markets).

From the end of June 2007 there was a renewal of broader market concerns about the implications of problems in the US sub-

Chart C ABX-HE (home equity) indices (different vintages and ratings)

(par value = 100)



Source: JP Morgan Chase & Co.
Note: The ABX-HE indices are value indices of CDSs on asset backed US sub-prime non-agency securities.

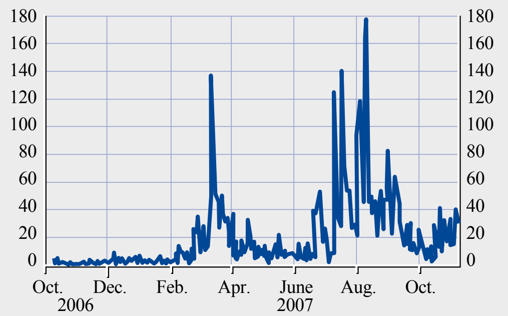
Table Timeline of the turmoil in financial markets

27 February 2007	Global equity markets drop on fears about Asian equity markets and emerging concerns over further deterioration in the US sub-prime mortgage market. The relatively small correction (Dow Jones EURO STOXX 8%, S&P 500 6%) ends on 14 March and equity markets resume their upward trend.
20 June	News reports suggest that two Bear Stearns-managed hedge funds invested in securities backed by subprime mortgage loans are close to being shut down. Credit default swap (CDS) premia start increasing sharply, especially for companies with risky credit profiles (as shown by CDS crossover indices) and for financial institutions.
end-June/July	Rating agencies downgrade many securities (bonds, ABSs and collateralised debt obligations (CDOs)) backed by sub-prime loans.
July	Worsening market conditions in credit markets result in delays in the issuance of high-yield bonds, especially for leverage buyout financing. Underwriting banks have to keep the related loans on their balance sheets.
30 July	German bank IKB warns of losses related to the fallout from the US sub-prime mortgage market. The five-year European iTraxx Crossover index reaches a peak of 500 basis points. Liquidity in the European government bond market declines dramatically.
early August	Many investment funds, often linked to large financial institutions, face massive redemptions. Some of them also have redemptions frozen so as to avoid selling assets in very unfavourable market conditions.
9 August	The turmoil in the credit markets turns into a liquidity squeeze, as many banks become reluctant to lend money to other financial institutions. The ECB takes action in response to these increasing tensions, in a series of special refinancing operations (the first, on 9 August, with an overnight maturity and an amount of EUR 95 billion). The US Federal Reserve System and the Bank of Japan take similar steps.
August	The commercial paper market faces some signs of disruptions, especially in the ABCP segment. ABCP conduits face increasing problems finding investors for their commercial paper, prompting sponsor banks to provide them with liquidity or to take their assets directly onto their balance sheets.
16 August	Equity markets and emerging market assets fall as investor risk aversion rises sharply. Massive foreign exchange carry trade unwinding results in a sharp appreciation of the Japanese yen.
17 August	The Federal Reserve System cuts its discount rate by half a point to 5.75%.
14 September	The Bank of England provides emergency financial support to mortgage lender Northern Rock.
18 September	The US Federal Open Market Committee (FOMC) cuts interest rates by half a point to 4.75%.
September/October	Most asset markets seem to gradually recoup their losses. Money markets still face tensions, while market participants remain concerned about the impact of the turmoil on banks' results.
Early November	Renewed concern on banks writedowns following reported losses on subprime exposure and new concerns on possible weaknesses in other sectors, notably bond insurers.

prime mortgage market. News that two hedge funds managed by Bear Stearns, which were active in structured markets for credit instruments that had sub-prime exposure, had almost lost all their capital triggered a significant deterioration in credit markets. The market value of credit products based on sub-prime mortgages kept falling, as indicated by patterns in the ABX. HE (home equity) indices. These indices represent standardised baskets of home equity asset-backed security (ABS) reference obligations. There are several indices, based on the ratings of reference obligations (from AAA to BBB-). Losses on BBB- tranches continued to rise, reaching 80%, and AAA tranches, which had been so far little affected by sub-prime concerns, also faced mark-to-market losses (see Chart C). Those losses were amplified by a dramatic fall in financial market liquidity, as few investors remained willing to invest in US housing market-related products. Market liquidity concerns spread to most structured credit products, even those unrelated to the US sub-prime market. Many US and European funds with such assets faced massive withdrawals, obliging some of them to freeze redemptions to avoid having to immediately sell their assets in very unfavourable market conditions.

Chart D Financial media coverage of the US sub-prime mortgage market

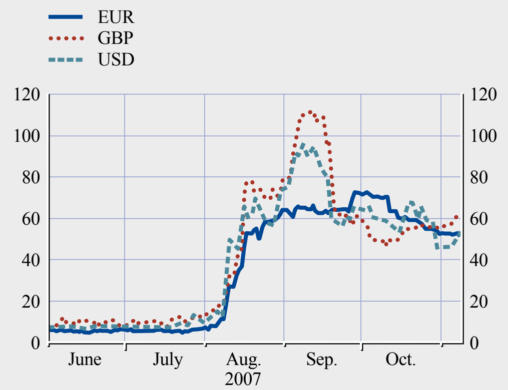
(number of news reports)



Sources: ECB and Reuters.
Note: The chart shows the daily number of Reuters news headlines containing the word "sub-prime".

Chart E Three-month spreads between deposit and overnight index swap rates

(basis points)



Source: Bloomberg.
Note: Spreads between EURIBOR and EONIA swaps (EUR), GBP LIBOR and SONIA swaps (GBP), and USD LIBOR and USD OISs (USD).

The deterioration of credit markets also led many banks to postpone the issuance of corporate bonds that they had underwritten, especially bonds to be issued for the financing of leveraged buyouts. The underwriting banks had to keep the related loans on their balance sheets, which created another source of risk for them. Consequently, the correction in the credit markets accelerated. The re-pricing of risk was particularly significant for banks (see Table). Some banks lacking sufficient sophistication in their risk management revealed much larger than expected and sometimes excessive exposures to structured credit products and significant mark-to-market losses, fuelling market concerns about the scale of the potential losses facing all financial institutions.

Consequently, the turmoil in the credit markets spread to other markets, and turned into a protracted drying up of liquidity in money markets, prompting central bank action aimed at restoring normal market functioning. Banks' off-balance-sheet risks, in particular their commitments to provide liquidity to conduits and structured investment vehicles (SIVs), became a market focus, fuelling a lack of confidence and prompting some financial institutions to stop lending to other banks, in particular for longer maturities (more than two weeks). As these renewed suspicions prevented a quick normalisation in the money markets, risk aversion rose across all markets, culminating on 16 August with a significant unwinding of foreign exchange carry trades and a sharp fall in risky assets such as equities and emerging market assets.[1] By mid-August the financial media coverage of the US sub-prime mortgage market related turbulence reached a peak (see Chart D).

While the impact of the market turmoil was unwound in many markets within a few weeks (particularly in the foreign exchange, equity and emerging markets), the normalisation of money markets was only gradual, as evidenced for instance by persistently wide spreads between unsecured three-month money market interest rates and overnight index swap rates (see Chart E). After mid-October, renewed concerns over the significant write-downs by many

1 The "barometer" presented in Box 7 in Section 3 helps explain the way contagion spread across market segments.

major banks fuelled another rise in risk aversion, resulting in declines in G3 equity markets and in higher implied volatilities across markets.

The turmoil that started in the summer of 2007 highlights two significant risks for financial markets. The first is market complacency: in an environment of abundant global market liquidity, many investors tend to underestimate risk, which makes a correction and a normalisation of risk necessary at some point. The succession of phases of strong risk appetite and of sharp corrections is typical of financial markets, but this process can become disorderly when combined with factors that create uncertainty. For instance, the market correction in May 2006, although significant, had only a relatively short-lived impact on financial markets, as it reflected a "normal" rebound in risk aversion following a long period of strong risk appetite. The recent correction had a much more serious impact on several markets (especially the money markets) because it was combined with great uncertainty about structured credit product losses.

The second significant risk for financial markets results from insufficient information. The securitisation of loans creates new challenges for investors as regards the nature and scope of the risks involved. The recent turmoil showed that many investors lacked real understanding of the behaviour under changed market circumstances of structured credit products in their portfolios. Moreover, the underlying assumptions in the pricing models for those complex instruments were not always robust to changing financial market conditions. In this context the role of the banks originating these products and of the agencies rating them should be emphasised. Finally, greater transparency with regard to the risks in banks' balance sheets and off their balance sheets (for instance their exposure to conduits and SIVs) would help markets correctly assess individual risks and thus avoid general crises of confidence.