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 form 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.