

IMF STAFF COMMENTS ON
EU COMMISSION CONSULTATION ON
SHORT SELLING

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Submission by:

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Please note that the views expressed in these comments are those of the IMF's staff, and not necessarily of its management or Executive Board.

1. The Fund staff welcomes this opportunity to comment on this working document of the Directorate General Internal Market and Services of the European Commission.¹ Short selling and naked short selling have become a topic of public interest as a result of the ongoing financial crisis and the purported downward financial stock price spirals it created. The regulatory treatment of short sales and naked short sales varied substantially across EU member states during the financial crisis. The Commission's proposal is a good first step towards a common framework on short selling.

¹ These comments have been prepared by the staff from the European, Legal, and Monetary and Capital Markets Departments.

Main points:

2. We agree with the Commission that short selling generally fulfills a valuable role in financial markets, and should be possible. Short selling is an important feature of a modern and developed financial market pricing and trading mechanism. It augments market liquidity, increases trading volumes and serves as a signal to discriminate perceived strong from weak firms or sovereigns. Short selling thus helps efficient price discovery and imposes market discipline as it forces firms/sovereigns to enhance capital buffers, reduce debt or undertake other corrective measures. At the same time, risks related to short selling must be acknowledged. These pertain to possible distortions of the price discovery process in case of market abuse and deliberate failures to deliver the shorted securities. Effective supervision and enforcement (see point #5) as well as enhanced transparency, margining and collateralization can help contain these risks.

3. We find no strong evidence that short selling led to falling prices. Evidence suggests that most of the adverse market movement in the current crisis can be attributed to fundamental factors and to uncertainty due to partial or inadequate disclosures. In effect, downward price movements are due to many factors other than short selling. In efficient markets, negative information should have a negative price impact. Short selling restrictions impede the flow of negative information into prices.

4. We concur that the wide variety of measures put in place across EU member states during the current crisis has been suboptimal and favor a more harmonized approach to short-sale regulations in the EU. In highly integrated markets, go-it-alone approaches are unnecessarily distortive and inadequately effective. We agree that the possibility to impose restrictions on short-selling in emergency situations can be a valuable fall-back option as long as it serves specific and well-identified public policy objectives, creates as few distortions as possible, is implemented within a predictable and reliable framework and exempts legitimate uses. It should be subject to clear rules and procedures, as well as the means to ensure EU-wide enforcement. In this respect, the Commission's proposals do not go far enough, notably with respect to the role of the European Security Markets Authority (ESMA), which could be strengthened by providing it a greater coordinating role in emergency situations.

5. We would also like to emphasize that while rules regarding short selling are necessary to mitigate the risks, they are only a complement to the overall supervision framework, which should ensure that market participants comply with trading and settlement regulation. Effective supervision practices should ensure that both the letter and the spirit of regulation which are meant to enhance price discovery and prevent pricing distortions are met. Introducing new rules will be ineffective unless there is compliance with these rules. The rules will also be rendered ineffective if they are easily circumvented through jurisdictional arbitrage. Supervision should prevent the occurrence of problems, through detection of lack of internal controls inside market participants for example.

Prevention is more effective and less costly than ex-post action against rule violators. Supervisors should also, however, have strong enforcement in place so that compliance with the regulatory framework carries with it sufficient consequence. For example, to the extent that settlement failures threaten to undermine short selling rules, there should be operations in place to deter failure.

A. Scope

Questions:

- (1) Which financial instruments give rise to risks of short selling and what is the evidence of those risks?**
- (2) What is your preferred option regarding the scope of instruments to which measures should be applied?**
- (3) In what circumstances should measures apply to transactions carried on outside the European Union?**

Benefits/Risks:

6. Short selling has many benefits which help improve market quality and efficiency. Short selling augments market liquidity and serves as a signal to discriminate perceived strong from weak firms and to detect fraud². It thus helps efficient price discovery and may prompt the firms in question to enhance capital buffers or undertake other remedial management activities. Short selling is used for many legitimate purposes, including exploiting information to profit from expected price decreases, to provide liquidity in response to unanticipated buyer demand, to facilitate arbitrage among cash, futures and options markets, or to hedge the risk of a long position in the same or a related security. It also generates additional income for long-term investors through securities lending. The Commission proposal notes that in crisis times, short selling has the potential of amplifying price falls and can result in information asymmetries. However, downward price movements may be due to many different factors besides short selling. If new information becomes available, efficient markets should adjust instantaneously and if the news is extremely negative, a large negative price impact would be in line with fundamentals. Furthermore, given the way financial markets function, for every (short) seller there is a party on the other side of the transaction who is willing to pay the given price. Moreover, an element that is lost a bit in the current crisis is that short selling also can help mitigate market bubbles and limit upward market manipulation.

² See Dyck, Morse, and Zingales (2007), *Who blows the whistle on corporate fraud?*, NBER WP 12882.

7. **Short selling is not without risk but efficient risk mitigation measures can achieve a lot.** Short sellers face infinite losses and limited upside: at best, the gain can be 100 percent if the security's price goes to zero; but price increases are—at least theoretically—unbounded. Short sellers may also be subject to a so-called short-squeeze whereby sellers are forced to close their positions when prices rise, which creates additional upward momentum. To mitigate those risks, several measures can be taken or are in place already:

- **Margin accounts.** Short sellers have to maintain a margin account, consisting of initial and variation margin. Many credit default swap (CDS) market participants, particularly dealers on dealer-to-dealer transactions, do not currently post initial margin. Margining acts as a primary counterparty risk mitigation technique. In order to prevent price manipulation, tighter margining rules or higher interest charges may be envisaged.
- **Collateralization.** For stocks, collateral requirements can help reduce counterparty risk exposures. It may be conceivable to put up more consistent and uniform requirements, as advocated in the April 2010 Global Financial Stability Report (GFSR) (see footnote 3).
- **Effective supervision practices.** These should ensure that both the letter and the spirit of regulation are met. Supervision should prevent the occurrence of problems, through detection of lack of internal controls inside market participants for example. Prevention is more effective and less costly than ex-post action against rule violators.
- **Enhancing transparency.** As noted in Section B., transparency on short position-taking could be enhanced.
- **Strong enforcement.** Supervisors should also, however, have strong enforcement in place so that compliance with the regulatory framework carries with it sufficient consequence. For example, to the extent that settlement failures threaten to undermine short selling rules, there should be operations in place to deter failure.

8. **In general, short selling is a symptom not a cause of the problem.** The causes of the financial crisis are manifold: macro- financial imbalances, inadequate risk management at individual institutions, too lenient supervision, and an unsustainable policy mix globally. Furthermore, inconsistent and uncoordinated regulatory actions caused significant uncertainty and spillovers.³

³ See IMF, *Initial Lessons of the Crisis*, Washington DC, February 2009.

- For sovereign CDS spreads, empirical evidence shows that a large proportion of the recent spread variation across advanced countries can be traced back to fundamentals (see Annex 1). Hence, speculation, as would be caused or amplified by (naked) short sales seems to be of relatively minor importance. Furthermore, the sovereign CDS market as a whole is negligible compared to the size of government debt, amounting to only 6 percent of the outstanding debt in gross terms and 0.5 percent in net terms in early 2010.⁴
- For financial institutions, initial overvaluation followed by revelations of bad investment decisions coupled with inadequate or slow disclosure of exposures to subprime assets appear to have caused a rapid correction in their stock price. Stock prices of banks most exposed to subprime problem assets appear to have decreased more. In the second phase of the crisis, the failure of Lehman and uncertainty over individual institutions' holdings of Lehman debt added to the continued price falls (see Annex 2).

9. **There is little evidence on the effectiveness of short sales bans.** In Europe, various market authorities banned (naked) short sales of financial stocks in September 2008 but this did relatively little to support the targeted institutions' underlying stock prices, while liquidity dropped and volatility rose substantially. Annex 3 suggests that market efficiency and quality in fact deteriorated substantially following the introduction of the various bans. Moreover, many of the financial institutions subject to short sales bans also are cross-listed, which created legal and territoriality issues as regards enforcement (see also section E.).

Scope

10. **There are numerous ways to engage in a short/naked short sale. An exhaustive listing will be challenging and prone to circumvention.** If financial market participants are convinced that financial stock prices need to fall in line with fundamentals, they can short the securities directly or indirectly (synthetically) through options or other derivatives (futures, forwards, swaps and other over the counter instruments). Even if the scope for (naked) short selling were defined very broadly, there is the—quite likely—possibility that financial innovation will succeed in circumventing the ban. Any financial strategy that delivers a negative delta can presumably be seen as a short sale and it will be difficult to have an exhaustive listing. Put differently, a generic definition of short sales remains elusive and would assume that regulators can arrive at a working definition of legitimate and illegitimate use of the products in question, which ranges from (proxy) hedging activity to outright speculation (see also point 6).

⁴ See also IMF, Global Financial Stability Report, Washington D.C., April 2010, Chapter 1, Annex 1.2.

B. Transparency

Questions:

- (4) What is your preferred option in relation to the scope of financial instruments to which the transparency requirements should apply?
- (5) Under Option A is it proportionate to apply transparency requirements to all types of instruments that can be subject to short selling?
- (6) Under Option B do you agree with the proposals for notification to regulators and the markets of significant net short positions in EU shares?
- (7) In relation to Option B do you agree with the proposals for notification to regulators of net short positions in EU sovereign debt (including through the use of CDS)? In addition to notification to regulators should there be public disclosure of significant short positions?
- (8) Do you agree with the methods of notification and disclosure suggested?
- (9) If transparency is required for short positions relating to sovereign bonds, should there be an exemption for primary market activities or market making activities?
- (10) What is the likely costs and impact of the different options on the functioning of financial markets?

11. We agree that transparency on short position-taking should be enhanced.

Increasing transparency on (naked) short selling is a better and more market-friendly approach compared to outright bans. However, care must be taken not to overburden market participants with additional disclosure requirements. In the case of sovereign CDS, already existing data sources should be exploited and monitored. Therefore, we would tend to limit the transparency regime to Option B (EU shares and EU sovereign bonds). At the current stage, we do not see the rationale for a different disclosure regime for sovereign bonds (only to the regulator and not to the market) as opposed to shares. As regards disclosure, we would urge for the establishment of a pan-european central information access point as opposed to country-by-country disclosures, in line with the EU's policy of fostering financial market integration and openness.

12. **Market making activity should be exempted** from the notification and disclosure requirements, to the extent that it can be clearly identified and separated from speculative position-taking. Pure market making is broadly market-neutral (see also under D.).

C. Uncovered short sales

Questions:

- (11) What are the risks of uncovered short selling and what is the evidence of those risks?
- (12) Is there evidence of risks of uncovered short sales for financial instruments other than shares (e.g. bonds or sovereign bonds), which would justify extending the requirements to these instruments?
- (13) Do you agree with the proposed rule setting out conditions for uncovered short selling? Do you consider that more stringent conditions could be put in place? If so please indicate which ones? Do you agree that arrangements other than formal agreements to borrow should be permitted if they ensure the shares are available for borrowing at settlement? If it's so, why?
- (14) Do you consider that the risks of uncovered short selling are such that they should be subject to any upfront ban/permanent restrictions? If it's so, why?
- (15) Do you agree with the proposal requiring buy in procedures for settlement failures due to short sales? If so, what is an appropriate base period that could be specified before buy in procedures are triggered (e.g. T + 4)?
- (16) Do you consider that there should be permanent limitations or a ban on entering into naked credit default swaps relating to EU sovereign issuers? If so, please explain why, including if possible any evidence relating to the use of naked CDS.
- (17) Do you consider that in addition to the measures described above there should be marking of orders for shares that are short sales?
- (18) What is the likely costs and impact of the different options on the functioning of financial markets?

Benefits/risks

13. What is being referred to as “naked” short selling (i.e., selling of securities, or using credit default swaps to purchase protection on, securities not owned) may be undertaken for legitimate reasons. There are situations where one would need to insure or hedge against downside risks without owning the underlying security. For instance, if one invests in a national airline and wants to protect against the downside risk of a sovereign crisis affecting the airline, one should be able to buy sovereign CDS without owning government debt. The April 2010 GFSR elaborates more on why naked shorts in sovereign CDS should not be banned. However, certain types of naked short selling may be tantamount to market manipulation as they show a sale has taken place while short sellers do not intend to or are not able to deliver the securities (depriving investors of certain benefits of ownership such as voting and dividends) or are not hedging other legitimate activity. Thus, market prices would not reflect true demand and supply in those cases.

14. More efficient risk mitigation measures coupled with effective supervision could achieve a lot to reduce the risks of naked short selling. Naked short selling does not

require an actual transfer (“delivery”) of securities upon conclusion of an agreement between the short seller and the buyer. Hence several risks arise, including counterparty risk⁵, the failure to deliver (settlement risk) and basis risk. To mitigate those risks, several measures can be taken or are in place already:

- **Collateralization.** For highly rated sovereigns, there are no collateral requirements in place which introduces counterparty risk exposure that must be hedged through other instruments. It may be conceivable to put up consistent and uniform requirements, as advocated in the April 2010 GFSR (see footnote 3).
- **Effective supervision practices, enhanced transparency and strong enforcement.** See Section A, point #7.

15. The lack of EU-wide coordination of measures on naked short sales can cause undesirable spillover effects and may make country-specific measures ineffective.

Measures to restrict naked short sales for financials or sovereign bonds in one country may cause spillover effects to other EU countries’ financial sectors or sovereigns, as the latter can become a proxy for shorting financial stocks or bonds from the other country. This is particularly acute if other countries do not impose similar restrictions or when there are implementation differences. Furthermore, if financials are listed in multiple jurisdictions, a ban in one country can easily be circumvented by diverting short trades to other locations, rendering it a rather ineffective instrument.

Upfront ban/permanent restrictions

16. Upfront bans and permanent restrictions on naked shorting appear undesirable (questions 14 and 16). As discussed above, there are good reasons to allow naked short sales through participation in the CDS market. Moreover, determining what is a “naked” position in economic terms is fraught with difficulties, as hedging economic risks may often require position-taking in related but separate instruments. More specifically, as detailed in the April 2010 GFSR, sovereign CDS should be considered as a tradable instrument in the risk management toolkit of portfolio managers (to protect economic exposures) and not only as a credit insurance.⁶ Also, it does not seem logical to treat sovereign CDS different from corporate CDS as this may introduce regulatory inconsistencies.

17. We view a ban on naked short sales as a suboptimal solution compared with clear(er) rules and more effective supervision. Much of the controversy over short sales stems from perceptions of abuse to drive prices down in order to create a self-reinforcing

⁵ Given that uncovered short sellers face infinite losses and limited upside, buyers with whom naked sellers enter into an agreement are exposed to substantial settlement risk.

⁶ See Annex 1.2 of the April 2010 GFSR for more details.

negative price dynamic. The first-best solution to deal with this is **a revised Market Abuse Directive or separate legislation** (see also comments under points #7, #13, and #14). Some other policies and market actions that may need to be explored are as follows:

- The Commission's proposed enhancement of **disclosure** of net short positions may help to deter large short position-taking (see under B) as it gives supervisors a tool for action, albeit a relatively soft one.
- **Circuit breakers** that come into effect for exchange-traded assets once stock prices drop by x percent or CDS spreads rise by y percent could have the same (or better) effect on extraordinary price movements, as they tend to have a calming effect on markets.
- **More proactive communication policies**, both by the institutions under attack and their supervisor, could help dispel rumors. For instance, if uncertainty about the health of financial institutions is causing short sales but is not justified by fundamentals, institutions and their supervisor should proactively communicate to address market concerns (e.g., by disclosing and/or certifying exposures and having backstop solutions in place, much like the current Committee of European Banking Supervisors (CEBS) stress test exercise for European banks⁷).
- **More effective supervision**, as mentioned in points #7 and #14.
- Furthermore, the **institutions under attack may well have to adjust** for good reasons. For instance, if financial institutions are extremely exposed to short-term financing constraints, a ban on short sales may not be enough to prevent funding liquidity risks for those institutions to materialize in a downside risk scenario. Ideally, those institutions should therefore (be forced to) reduce their reliance on short-term funding, possibly by changing their business model.

Marking of short orders

18. **If technically feasible, marking of short sales orders may be worth considering.** Naked short selling does not require an actual delivery of securities upon conclusion of an agreement between the short seller and the buyer, even though the records will show that a sale has taken place. Hence, in order to reflect 'true' supply and demand, consideration could be given to marking of short sales orders. However, it must be noted that short selling could happen accidentally, e.g., due to a technical failure to deliver at settlement, the inability to obtain borrowed shares in time for settlement or due to bona fide market making activity

⁷ See CEBS's press release on state of play with the 2010 EU wide stress testing exercise (June 18, 2010) and CEBS statement on key features of the extended EU-wide stress test (July 7, 2010).

where brokers provide liquidity without necessarily owning the securities. Hence, such markings may not be entirely accurate.

D. Exemptions

Questions:

(19) Do you agree with the proposed exemption for market making activities? Which requirements should it apply to?

(20) Do we need any exemption where the principal market for a share is outside the European Union? Are any other special rules needed with regard to operators or markets outside the European Union?

(21) What would be the effects on the functioning of markets of applying or not applying the above exemptions?

19. **Market making activities should be exempted.** Market makers cannot be expected to have sufficient stocks of underlying as they post prices in both directions: the outcome is a result of supply and demand forces. Hence, a temporary but reasonable shortage of underlying securities is justified. Due to risk management considerations, pure dealers in general are not inclined to take large directional bets but hedge as part of their market making activity. However, where market making is not clearly separated from speculative position-taking, the exemption should not apply to the latter.

E. Emergency powers of competent authorities

Questions:

(22) Should the conditions for use of emergency powers be further defined?

(23) Are the emergency powers given to Competent Authorities and the procedures for their use appropriate?

(24) Should the restrictions be limited in time as suggested above?

(25) Are there any further measures that could ensure greater coordination between competent authorities in emergency situations?

(26) Should competent authorities be given further powers to impose very short term restrictions on short selling of a specific share if there is a significant price fall in that share (e.g. 10%)?

20. **In case of emergency, an EU-wide coordinated temporary ban may be contemplated. However, full harmonization of rules, procedures, applicability, and enforcement is needed.** The latter would prevent spillover effects from proxy-shorting and help maintain a level playing field for institutions across countries and markets. If uncoordinated, a ban on short sales in one country can be easily circumvented and arbitrage trades can bring down prices of financials of the country in question as well as markets in other countries or adversely affect the common currency. Uncoordinated or conflicting

responses could also leave EU crisis management policies in disarray and serve to intensify a financial crisis as markets doubt the adequacy of the policy response(s). Therefore, staff supports the Commission's efforts to harmonize rules as well as tools for emergency situations across the EU, and emphasize the need for full coordination across EU countries, banning (naked) short sales in emergency situations. However, Fund staff would like to stress that the ban should only apply in emergency situations and make proper allowance for legitimate uses before being put in place (see points #6, #13, and #19).

21. **Furthermore, Fund staff calls for better underpinning of emergency short sales bans.** Looking at the current cases, short sales bans have been invoked based on systemic risk grounds, but the motivation was relatively limited. Ideally, a temporary ban should be based on a detailed report of market developments and factors that led to its imposition. In addition, the report should also spell out the factors and market developments that would lead to a lifting of the temporary ban on short sales.

22. **The role of ESMA in emergency situations needs to be strengthened.** In the current proposal, ESMA's powers are limited to issuing advice and forcing EU member states to explain actions taken contrary to the ESMA advice. There also appear to be important issues regarding timeliness of notifications in case of cross-border spillovers. A larger role for ESMA could be a key in delivering EU-wide coordination of rules and procedures.

23. **Fund staff rejects a permanent ban on (naked) short sales.** Restrictions on short and naked short sales did not materially stop bank equity price falls, as discussed above and in Annex 2 and 3. This supports the case against permanent bans (question 24). Moreover, a growing body of literature suggests that bans have limited or even outright negative effects on market liquidity, quality and efficiency (see also point 8 and Annex 3).⁸

⁸ See Bris, *Short selling activity in financial stocks and the SEC July 15th emergency order*, August 2008, IMD (Switzerland); Clifton and Snape, *The effect of short-selling restrictions on liquidity: Evidence from the London Stock Exchange*, University of Sydney, December 2008; Curtis and Fargher, *Does short-selling amplify price declines or align stocks with their fundamental values?*, ACT (Australia), December 2008; Boehmer, Jones and Zhang, *Shackling short sellers: The 2008 shorting ban*, Cornell University, January 2009; Financial Services Authority, *Statistical analysis: assessing the effects of the temporary short selling ban*, FSA (U.K.), February 2009; Fotak, Raman, and Yadav, *Naked short selling: The emperor's new clothes?*, University of Oklahoma, May 2009; Beber and Pagano, *Short-selling bans around the world: Evidence from the 2007–09 crisis*, CEPR Discussion Paper 7557, November 2009; Lioui, *Spillover effects of countercyclical market regulation: Evidence from the 2008 ban on short sales*, EDHEC (France), March 2010; Helmes and Henker, *The effect of the ban on short selling on market efficiency and volatility*, UNSW (U.K.), November 2009.

F. Powers of competent authorities

Questions:

(27) Should the power to prohibit or impose conditions on short-selling be limited to emergency situations (as set out in the previous section)?

(28) Are there any special provisions that are necessary to facilitate enforcement of the future legislation in this area?

(29) What co-operation powers should be foreseen for ESMA on an ongoing-basis?

24. **Fund staff believes bans on short-selling should be limited to emergency situations and serve clearly defined objectives.** As mentioned in section C, other policies can be envisaged to achieve the same result with less distortional effects in terms of market efficiency and quality—especially in normal times. Besides, in the current crisis, fiscal and central bank support measures appear to have been more effective to stop adverse market trends than short selling bans. Furthermore, bans may be counterproductive as they transfer the selling pressure to other parts of the financial market and make legitimate hedging of exposures more costly and complex. This notwithstanding, the possibility to impose restrictions on short-selling in emergency situations can be a valuable fall-back option as long as it serves specific and well-identified public policy objectives, create as few distortions as possible, and is implemented within a predictable and reliable framework. It should be subject to clear rules and procedures, as well as the means to ensure EU-wide enforcement, and make proper allowance for legitimate uses (see also point #20). In this respect, we do not think the Commission’s proposals go far enough, notably with respect to the role of the ESMA, as discussed in Section E.

G. Glossary of definitions

Question:

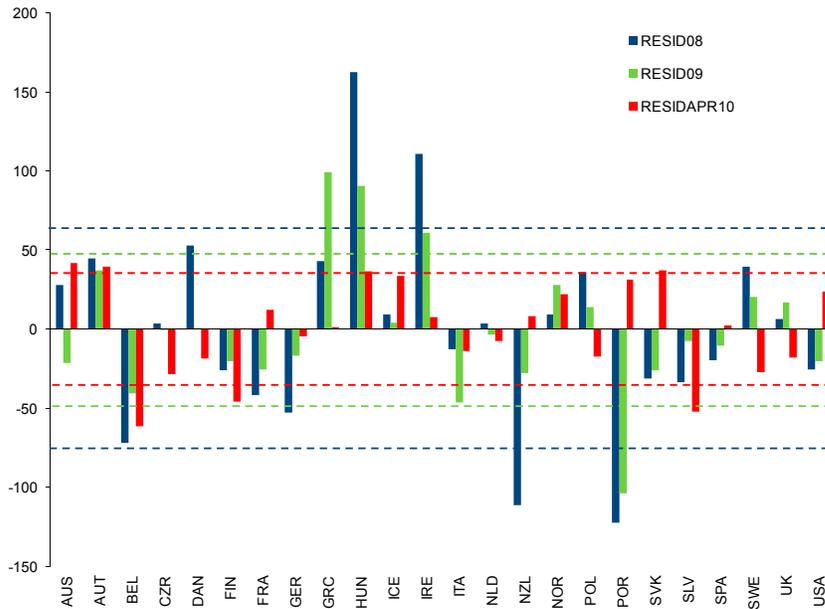
(30) Do the definitions serve their intended purpose?

25. **We have no specific comments on the glossary except that a generic definition of short sales remains elusive.** This reflects the wide spectrum of activity that can constitute covered versus naked positions and presupposes that regulators can arrive at a working definition of legitimate and illegitimate use of the products in question which ranges from (proxy) hedging activity to outright speculation.

Annex 1. Sovereign CDS Spreads—the Role of Fundamentals

An analysis of the cross-country variation in credit default swaps finds strong explanatory power for fundamental factors. During the current phase of the financial crisis (November 2009 to now), sovereign risk has come to the fore and government bond yield differentials with Germany and sovereign CDS spreads widened substantially, especially for GIIPS countries (Greece, Italy, Ireland, Portugal, and Spain). CDS spreads supposedly reflect perceptions of default risk of a borrower, and in case of sovereigns, reflect the intensity of fiscal sustainability and financing challenges. Some suggest that CDS spread levels are excessive and attribute short-term speculation and naked short selling. However, our empirical analysis finds that for 24 advanced countries,⁹ the level and variation in 5-year sovereign CDS spreads since 2008 are reasonably well explained by fundamentals including the deficit and debt level, current account balance, GDP growth, and GDP per capita. The influence of these factors changes over time. The adjusted R^2 of the equations, estimated as a seemingly unrelated system, were 0.88 for end-2008, 0.73 for end-2009, and 0.95 for April 2010. Annex 1.2 from the April 2010 GFSR contains complementary analysis in support of these conclusions.

Figure 1. Model residuals for sovereign CDS spreads of advanced economies



Source: Datastream, WEO, IMF staff calculations.

Note: Figure displays model residuals from a seemingly unrelated regression system and horizontal bars are one standard deviation bands. RESID08: model residuals for sovereign 5y CDS for end-2008, RESID09: residuals for end-2009 and RESIDAPR10: residuals for end-April 2010.

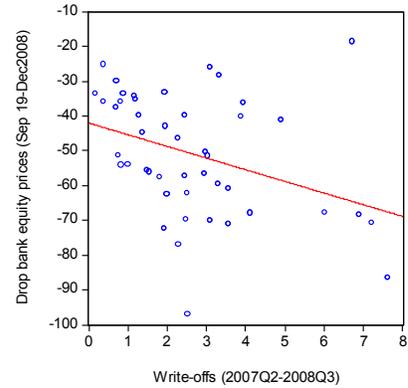
⁹ The sample covers Australia, Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, United Kingdom, and the United States.

Annex 2. Bank Equity Prices—the Role of Fundamentals

Bank equity prices fell more for institutions that revealed more write-offs, despite short sales bans. U.S. and European banks most exposed to subprime assets suffered the largest income hits and saw their equity price decline the most after short sales bans were introduced (Figure 2). This suggests that fundamentals played a large role in the price decline of bank stocks.

Banks more exposed to risky assets had the largest equity price falls. We follow Knaup and Wagner (2008) to capturing banks' exposure to risky assets.¹⁰ Their approach exploits differences in bank share price sensitivities to CDS spreads of borrowers of varying quality. They derive a bank credit risk indicator (CRI) as the perceived share of high risk exposures in a bank's portfolio relative to both high risk (speculative grade corporate CDS) and low risk (investment grade corporate CDS) exposures, controlling for various proxies of discount rates. It appears that for a sample of 50 EU banks, larger bank equity price drops were associated with higher CRIs, higher loadings on speculative grade investments, and lower loadings on high grade investments (Figure 3 and 4).

Figure 2. U.S. and EU banks' Equity Price Falls and Write-offs



Source: Bloomberg, Datastream, IMF staff calculations. The red line is a regression line. Write-offs over the period Q2 2007-Q3 2008 and equity price falls over Q2 2007-Q4 2008.

Figure 3. EU Banks' Stock Returns in 2008 After the Short Sales Bans versus Pre-crisis CRI¹³

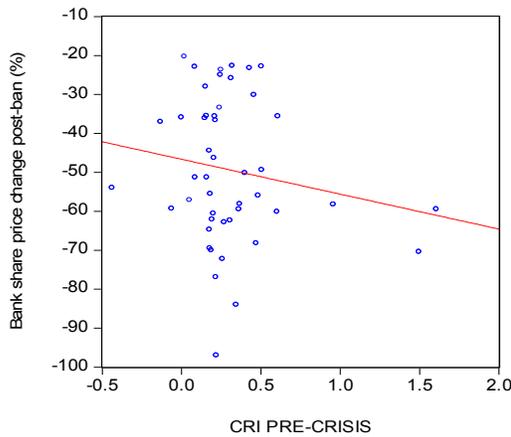
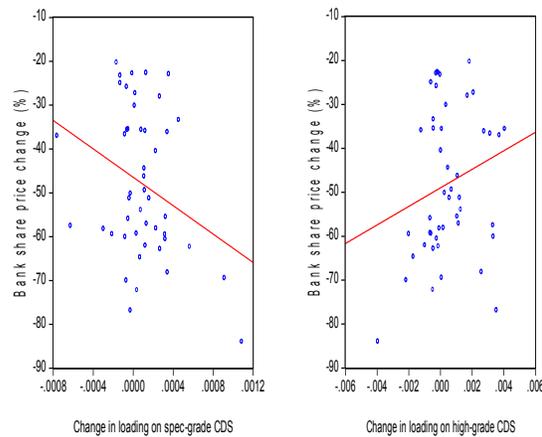


Figure 4. EU Banks' Stock Returns versus Change in Factor Loading on Speculative and High Grade Corporate CDS²³



Source: Datastream, JP Morgan, staff calculations

Notes: Red lines in the figures are regression lines. ¹ Pre-crisis credit risk index (CRI) is estimated over January 2004-June 2007 (daily data). ² Change in loadings on speculative and high grade CDS refer to the respective difference of coefficients in estimations of the CRI following the ban and the pre-crisis sample. ³ Bank share price drops are for the period September 19-December 31, 2008 (i.e., following the introduction of short sales bans in the various jurisdictions).

¹⁰ Knaup and Wagner (2008), A market-based measure of credit quality and banks' performance during the subprime crisis, Tilburg University, and CentER Working Paper, 28 September.

Annex 3. EU Countries Bank Equity Price Developments

Since the introduction of short sales bans in various EU countries, bank equity prices have fallen further and stabilized only gradually. Figure 5 shows the development in bank equity prices for EU countries since the ban on short sales and naked short sales as of September 19, 2008. The ban first took effect in the U.K. and was followed by similar short sales bans in other EU countries, except Spain, Finland and Sweden. However, bank stocks fell further which suggests that short sales bans have been generally ineffective to arrest downward price spirals. Arguably, it was only after comprehensive EU coordinated fiscal support measures took effect in Q1 2009 covering liabilities (guaranteed bond issuance), assets (asset insurance/transfer schemes), and capital (public capital injections into troubled banks) that a floor for bank equity prices was established.

What would have happened in the absence of short sales bans? Although it is difficult to answer this question precisely, the behavior of cumulative abnormal returns on bank equities can provide an answer. The test in Figure 6 uses pre-crisis data from 2006 to estimate expected returns. The difference between actual and expected returns, cumulated over time, indicates that since the introduction of short sales bans, bank equity prices declined much more than expected based on historical patterns. Hence, the various short sales bans appear to have made things worse.

Short sales bans appear to have had negative effects on market efficiency. Following the methodology of Bris et al (2007),¹¹ two tests show that after the bans market efficiency deteriorated. In general, more efficient markets can be expected to have more idiosyncratic risk since market participants can act more quickly and inexpensively upon firm and sector-level information. This would suggest that in more informational environments, the co-movement between firms (sectors) and the market should be lower. Bris et al showed that the downside R-squared and the cross-autocorrelation in the presence of short sales restrictions should be higher because it impedes the flow of negative market information into prices. Evidence in Figures 7 and 8 broadly support this view.

Market quality also suffered during this period. Bans on short sales were imposed with the aim of stopping manipulation through naked short selling threatening banking sector stability. Hence, they should help improve liquidity and reduce volatility of bank equity prices. However, Figures 9 and 10 show that this did not happen across the board. Volatility increased sharply immediately after the bans were introduced (from 19 September 2008 onward) and rose even further in early October, until EU coordination took place on fiscal support measures. The same holds for liquidity, which is captured by the price impact of trade. In liquid markets, the price impact of trade should be relatively limited. Comparing the 15-week period following the ban with the 15 weeks prior to the ban shows that illiquidity increased substantially in all EU countries that imposed bans, albeit to different degrees. The immediate impact on liquidity, 1 week after the bans came in place, was also negative in 8 out of 12 EU countries (all except Austria, Greece, Luxembourg, and Portugal).

¹¹ Bris, Goetzmann, Zhu (2007), Efficiency and the Bear: Short sales and markets around the world, *Journal of Finance*, 62 (3), 1029–1079.

Figure 5. EU Banking Sector Equity Price Developments Since the Short Sales Bans (Index = 100 on 9/19/2008)

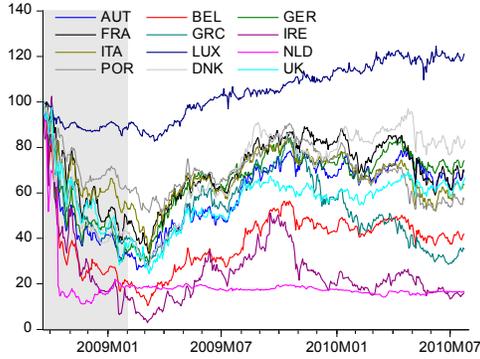


Figure 6. EU Banking Sectors Cumulative Abnormal Returns Since the Short Sales Bans¹ (%)

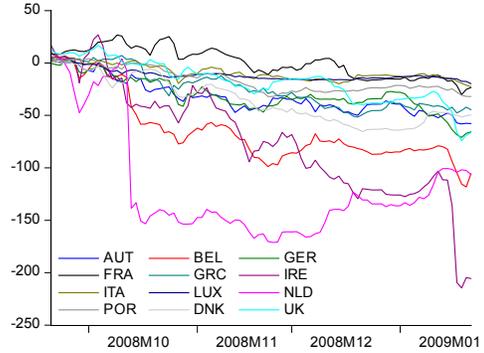


Figure 7. CAPM R^2 Before and After the Short Sales Ban for EU Banking Sectors²

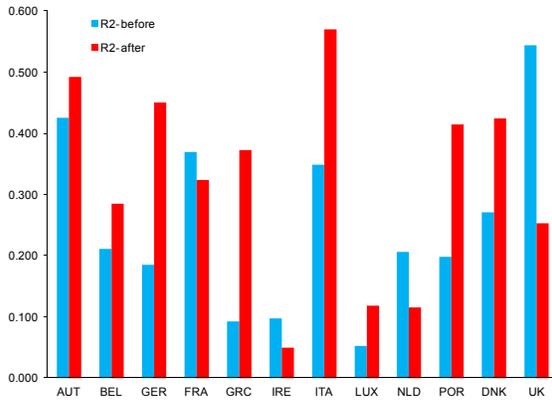


Figure 8. Cross-autocorrelation of EU Banking Sectors Before and After Short Sales Bans³

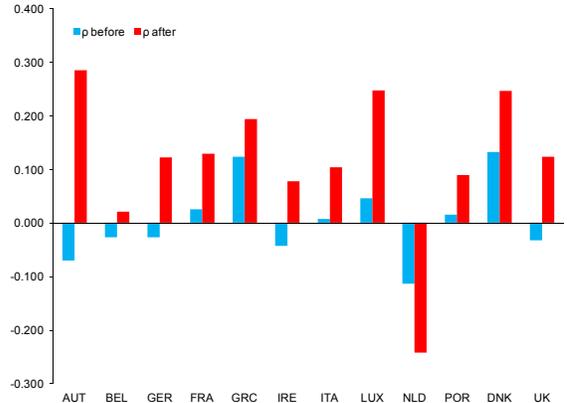


Figure 9. Volatility of EU Bank Equity Markets⁴ (Index = 100 on 9/19/2008)

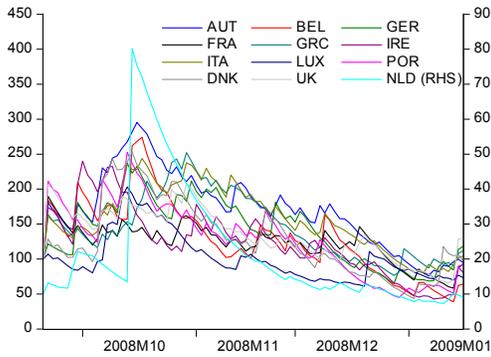
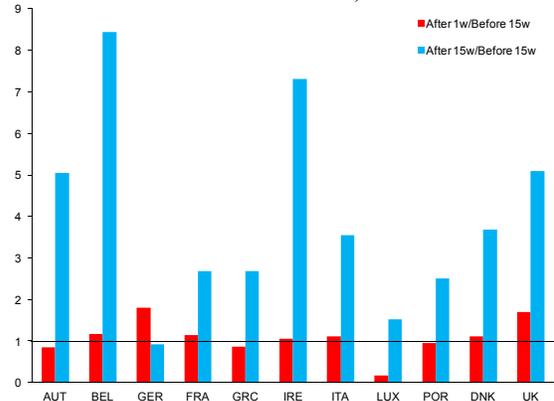


Figure 10. Illiquidity of Bank Equity Markets⁵ (ratio of illiquidity N weeks after/15 weeks before ban)



Source: Datastream and IMF staff calculations.

Notes: ¹ Cumulative abnormal returns are calculated from the capital asset pricing model (CAPM) estimated using 2006 data: $R_i = a + bR_{EU}$ with R_i the bank sector index and R_{EU} the EU market index. ² The R^2 is the CAPM regression R^2 estimated

90 days prior to the Lehman default (9/15/2008) and 90 days following the introduction of short sales bans in the UK (9/19/2008) and subsequently, in other EU countries.³ Rho is the cross-autocorrelation between bank index returns and the lagged EU market index.⁴ Volatility is estimated as a GARCH (1,1) over the period January 2006-July 2010 with daily data.⁵ Illiquidity is measured by the price impact of trade—the ratio of the weekly average absolute return to volume—as in Amihud (2002), Illiquidity and stock returns: cross-section and time series evidence, *Journal of Financial Markets*, 5 (1), 31-56.