



The impact of short-selling constraints on financial market stability in a heterogeneous agents model



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ABSTRACT

Recent turmoil on global financial markets has led to a discussion on which policy measures should or could be taken to stabilize financial markets. One such a measure that resurfaced is the imposition of short-selling constraints. It is conjectured that these short-selling constraints reduce speculative trading and thereby have the potential to stabilize volatile financial markets. The purpose of the current paper is to investigate this conjecture in a standard asset pricing model with heterogeneous beliefs. We model short-selling constraints by imposing trading costs for selling an asset short. We find that the local stability properties of the fundamental rational expectations equilibrium do not change when trading costs for short-selling are introduced. However, when the asset is overvalued, costs for short-selling increase mispricing and price volatility.

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1. Introduction

The practice of short-selling – borrowing a financial instrument from another investor to sell it immediately and close the position in the future by buying and returning the instrument – is widespread in financial markets. In fact, short-selling is the mirror image of a “long position”, where an investor buys an asset which did not belong to him before. While a long position can be thought of as a bet on the increase of the assets' value (with dividend yield and opportunity costs taken into account), short-selling allows investors to bet on a fall in stock prices. Some people have argued that such betting may increase volatility of financial markets and even lead to the incidence of crashes. A proposed policy would then restrict short-selling. In this paper we investigate consequences of such a restriction in a heterogeneous agents model of a financial market and show that it may increase mispricing as well as price volatility.

The historical account of Galbraith (1954) provides evidence that short sales were common during the market crash of 1929. As short-sellers were often blamed for the crash, the Securities and Exchange Commission (SEC) introduced the so-called “uptick rule” in 1938, which prohibited the selling short “on a downtick”, i.e., at prices lower than the previous transaction price. Curiously enough, the uptick rule was removed on 6 July, 2007, right before the market crash of 2008–2009 began. Fig. 1 shows the evolution of the S&P500 index and indicates the end of the uptick rule period by the dotted vertical line in the left part of the figure. Since its removal, calls to restore the uptick rule have been recurrent. The dates of the statements by different practitioners, authority experts, congressmen and senators for restoring the uptick rule are indicated in Fig. 1 as well. These calls did not remain unanswered and in the fall of 2008 – at the peak of the credit crisis – the SEC temporarily prohibited short-selling in 799 different financial companies. The SEC's chairman, Christopher Cox,

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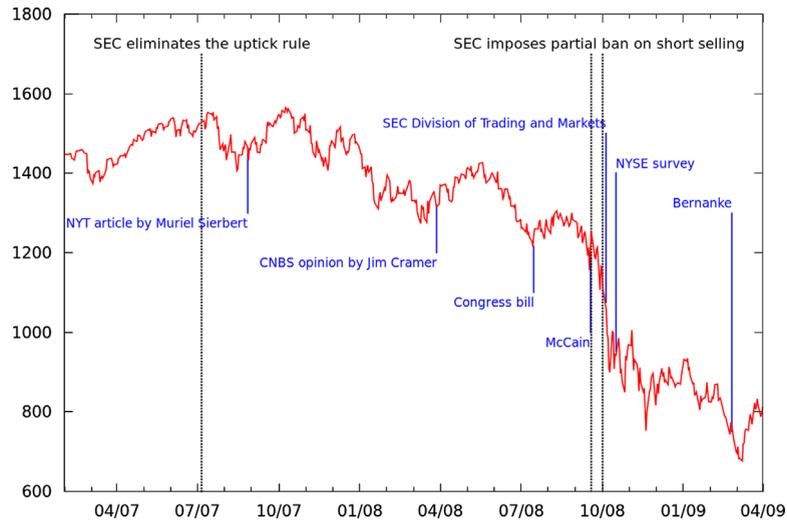


Fig. 1. S&P 500 and the uptick rule. The end of the “uptick rule”, the period between 19 September 2008 and 2 October 2008, when the short-sales ban for 799 financial stocks was in place, and the major calls for reinstatement of the rule are shown.

argued that: “The emergency order temporarily banning short selling of financial stocks will restore equilibrium to markets.”¹ The period for which the short-selling ban was imposed is indicated by two vertical lines in the right part of the figure. Even more stringent policies have been adopted in other countries, see [Beber and Pagano \(2013\)](#) for an overview. It is not clear, however, whether such a ban on short-selling has actually been helpful in stabilizing financial markets. According to [Boehmer et al. \(2009\)](#) the price for the banned stocks sharply increased when the ban was announced, but gradually decreased during the ban period. The whole S&P500 index continued to fall during the short-sell ban as well as afterwards, see [Fig. 1](#).

The traditional academic view on constraints on short-selling is that they may lead to overpricing of the asset.² [Miller \(1977\)](#), for example, argues that the equilibrium price between demand and supply for a risky asset reflects an average view among heterogeneous investors about the asset's value. The investors with the most pessimistic view on the future view of the asset may sell the asset short at the equilibrium price. Therefore, the constraints on short-selling effectively restrict the supply of shares, leading to a higher equilibrium price level than would emerge in the absence of constraints. In the more sophisticated, dynamic model of [Harrison and Kreps \(1978\)](#) risk-neutral investors have different expectations about the dividends of a certain asset and perfect foresight about beliefs of the other investors. In the absence of short-selling constraints, investors with different opinions take infinitely large, opposite positions. When the constraints are imposed, the price reflects the beliefs of the most optimistic investors, and due to speculative motives the actual price may even be higher.

However, since these first contributions other models have been developed that predict no mispricing or even underpricing as a consequence of short-selling constraints. [Diamond and Verrecchia \(1987\)](#) argue that since the constraints are common knowledge, financial market participants should take them into account both in their behavior as well as in their beliefs about the behavior of the other market participants. In their model of asymmetric information (based on [Glosten and Milgrom, 1985](#)) short-selling prevents some investors from desired trading. Even if not all private information is fully incorporated into the order flow, the fully rational and risk-neutral market-maker will take the existence of short-selling constraints into account, and will set bid and ask prices at the correct level. [Bai et al. \(2006\)](#) show that this result might change when rational traders are risk-averse. In this case uninformed traders will ask a premium for their higher perceived risk (because the short-selling constraints slow down price recovery), which leads to lower prices. But the model of [Bai et al. \(2006\)](#) may also result in the opposite prediction, as a consequence of smaller supply. Similarly, in a general equilibrium economy considered by [Gallmeyer and Hollifield \(2008\)](#) the short-sell constraints can lead either to overpricing or to underpricing depending on the intertemporal elasticity of substitution of the optimists. Notice that many of these results are obtained by assuming that investors are unboundedly rational. Laboratory experiments with paid human

¹ See <http://www.sec.gov/news/press/2008/2008-211.htm>.

² Apart from the legal constraints, short-selling may also be constrained because it may be costly, compared to taking a “long position”. In particular, an investor willing to sell short should eventually deliver the shares to the buyer, and hence is required to “locate” the shares, i.e., to find another investor who is willing to lend these shares. (When shares have not been located, the operation is called “naked short-selling”, which is subject to more strict regulations and is often banned, since it is believed to permit price manipulation.) In the absence of a centralized market for lending shares such an operation may be complicated. At least, it is costly, because short-selling requires not only paying a standard fee to the broker but also involves a commission (plus dividends) to the actual owner of the stock. Moreover, there is a recall risk of the lender wanting to recall a borrowed stock.

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