



# Which short-selling regulation is the least damaging to market efficiency? Evidence from Europe



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## ABSTRACT

Exploiting cross-sectional and time-series variations in European regulations during the July 2008–June 2009 period, we show that: (1) prohibition on covered short selling raises bid-ask spread and reduces trading volume, (2) prohibition on naked short selling raises both volatility and bid-ask spread, (3) disclosure requirements raise volatility and reduce trading volume, and (4) no regulation is effective against price decline. Overall, all short-sale regulations harm market efficiency. However, naked short-selling prohibition is the only regulation that leaves volumes unchanged while addressing the failure to deliver. Therefore, we argue that this is the least damaging to market efficiency.

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## 1. Introduction

Short sellers are the usual suspects for financial turmoil and price decline. In Europe in particular, short sellers are blamed for the debt crisis. Therefore, since September 2008 European regulators have taken action to curtail short-selling activities. However, the new regulations have been introduced in a highly dispersed way. In this paper, we take advantage of the opportunity offered by this natural experiment involving 14 European markets over a one-year period. Exploiting both cross-sectional and time-series variations in regulatory regimes, we study the effects of short-sale constraints on market efficiency in Europe.

Our conclusions are especially relevant in light of the recent developments in the European regulatory landscape. New measures on short selling became applicable in EU countries as from 1 November 2012. These measures include public disclosure requirements on net short positions and restrictions on naked short sales (Council of the European Union, 2012). Compared to

existing work, this paper makes two methodological innovations. First, we compare the effects of three regulatory regimes (prohibition on naked short sales, prohibition on covered short sales, and disclosure requirement) on individual stocks' daily bid-ask spreads, intraday volatility, and trading volume, and weekly returns. Disclosure regimes, in particular, have been ignored in the empirical literature so far.<sup>1</sup> Second, we examine the effects of those regimes while controlling for the impact of the global financial environment.

Two main theoretical articles study the impact of short-sale prohibition and restrictions on market prices. First, Miller (1977) suggests that short-sale prohibition leads to asset overvaluation because it prevents pessimists who do not own the asset from selling, while optimists can always buy. Second, Diamond and Verrecchia (1987) argue that short-sale prohibition leads to slower price adjustment and higher bid-ask spreads, since information driven by short sales is lost. Thus, Miller (1977) and Diamond and Verrecchia (1987) share the argument that short-sale prohibitions

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<sup>1</sup> Beber and Pagano (2013) do actually use a disclosure dummy, but their analysis does not focus on the impact of this dummy.

**Table 1**  
State of the art on the impact of short-sale regulations during the 2008–2009 crisis.

Authors	Data set	Type of regulation	Impact on bid-ask spread	Impact on volatility	Impact on volume	Impact on return	Other
Boehmer et al. (2011)	US 2008	PCSS	+	+	–		
Autore et al. (2011)	US 2008	PCSS				+	
Kolasinski et al. (2013)	US 2008	PNSS and PCSS					Information content of trades (+)
Fotak et al. (2009)	US 2008	PNSS			–	=	
Harris et al. (2009)	US 2008	PCSS				+	
Gagnon and Witmer (2010)	US 2008	PCSS	+		–	+	
Hansson and Fors (2009)	UK 2008–9	PCSS	+	=	–	=	
FSA (2009)	UK 2008–9	RDSS	+	+	–	=	
Marsh and Payne (2012)	UK 2008–9	PCSS	+	+	–	=	Bilateral trading (+)
Oliver Wyman (2010)	UK 2008–9	RDSS	+	+	–		
AMF (2009)	France 2008	PNSS and RDSS	=	=	–	+	
Helmes et al. (2010)	Australia 2008–9	PCSS	+	+	–	=	
Beber and Pagano (2013)	World 2008–9	PNSS, PCSS (and RDSS)	+			= Except US (+)	Speed of price adjustment (+)

The table summarises the findings of recent empirical studies on short-sale regulations during the 2008–2009 crisis. Results concern the effects of different types of regulations (PCSS: prohibition on covered short selling; PNSS: prohibition on naked short selling; RDSS: disclosure requirement for short positions) on bid-ask spread, volatility, traded volume, and return, which can be positive (+), non significant (=) or negative (–).

stifle market efficiency, either by distorting prices or by slowing down price adjustments and widening bid-ask spreads.

In line with theory, international evidence supports the view that short-sale regulations create market distortions. The empirical research on this issue starts with [Bris et al. \(2007\)](#) who exploit the cross-sectional differences between national regulations. They find that stocks traded in countries where short sales are practiced incorporate information faster, and have lower asymmetric response to bad-versus-good news. [Chen and Rhee \(2010\)](#) test Diamond and Verrecchia's hypothesis on the Hong Kong market, which has a list of shortable stocks updated every three months. They confirm that the prices of shortable stocks adjust faster to new information.

The regulations on short sales put in place following the outburst of the 2008 financial crisis can be broken into three categories<sup>2</sup>: (1) prohibition of covered (and also naked) short selling (PCSS), (2) prohibition of naked short selling (PNSS), and (3) regulatory disclosure for short selling (RDSS), i.e., requirement to disclose short positions to the market's regulator. [Table 1](#) summarises the results obtained in the literature on the impacts of PCSS, PNSS, and RDSS on bid-ask spreads, stock intraday volatility, trading volume, and the level of weekly returns, respectively. [Table 1](#) shows that the impacts of the three types of regulations have not been fully disentangled so far. Such disentanglement is precisely the aim of this paper, which concentrates on the European stock market.

The U.S. were the first country to take action during the 2008–2009 financial crisis, with the Securities and Exchange Commission (SEC) banning naked short selling on 19 financials from 21 July until 12 August 2008. Later, on 19 September 2008, the SEC issued a temporary ban on all short sales, which affected almost 1000 financial stocks and lasted until 8 October 2008. Analyzing the US stock market, [Boehmer et al. \(2011\)](#) find that PNSS reduces daily volumes and raises bid-ask spreads and intraday volatilities. [Harris et al. \(2009\)](#) show that PCSS also leads to price inflation while [Autore et al. \(2011\)](#) confirm Miller's hypothesis that highly volatile stocks are more likely to be overvalued. Consistent with Diamond and Verrecchia's restriction-effect hypothesis, [Gagnon and Witmer \(2010\)](#) demonstrate that short-sale restrictions impede arbitrage

activities. In the same vein, [Kolasinski et al. \(2013\)](#) find that these restrictions increase the informational content of trades. This confirms that PNSS affects non-informed short sellers differently than well-informed ones. Lastly, [Fotak et al. \(2009\)](#) show that PNSS reduces trading volumes. Moreover, they find no evidence that short sales are responsible for the sharp declines in financial stocks during the 2008 crisis. Notably, [Helmes et al. \(2010\)](#) find similar results on Australian data.

European regulations have also captured attention. [Hansson and Fors \(2009\)](#) focus on the UK PCSS, effective from 19 September 2008 until 16 January 2009. They find a significant decrease in volumes and a widening of bid-ask spreads, but no impact on intraday volatility and abnormal returns. These findings are confirmed by a study performed by the UK Financial Services Authority ([FSA, 2009](#)). In addition, the consultancy firm [Oliver Wyman \(2010\)](#) shows that the UK public disclosure regime is detrimental for spreads and trading volumes. [Marsh and Payne \(2012\)](#) point out that these negative effects merely affected the financial sector and encouraged bilateral off-market trading. The French regulator ([AMF, 2009](#)) made an impact assessment of its 2008 disclosure regime and naked short-selling ban on financials. This small-scale study<sup>3</sup> shows a rather small impact of the regulatory measures.

In one of the most comprehensive studies to date, [Beber and Pagano \(2013\)](#) make an overview of the 2008–2009 regulations around the world. They find that both PNSS and PCSS increase bid-ask spreads. This effect is stronger for small-cap stocks, high-volatility stocks, and stocks with no tradable options. Furthermore, [Beber and Pagano \(2013\)](#) find no evidence of stock overvaluation except in the U.S. Finally, both prohibition types are associated with a slow-down in price discovery, especially on down-market days.

Our study encompasses the previous ones performed on European markets. This is made possible by fully exploiting the cross-sectional dimension of our sample made of 14 markets. Overall, our results confirm the theoretical predictions from both [Miller \(1977\)](#) and [Diamond and Verrecchia \(1987\)](#), with some nuances however. We show that European PCSSs lead to higher bid-ask spreads and lower trading volume. On the other hand, PNSSs permanently raise intraday volatility and bid-ask spreads

<sup>2</sup> This corresponds to the classification adopted by the [European Commission \(2010a\)](#).

<sup>3</sup> It is an impact study comparing the five days after the introduction of the regulation to the five days before it. This study is admittedly performed in a situation where controlling for the specificities of the financial sector stocks is hardly feasible.

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