



Market Declines: What Is Accomplished by Banning Short-Selling?

Robert Battalio, Hamid Mehran, and Paul Schultz

In 2008, U.S. regulators banned the short-selling of financial stocks, fearing that the practice was helping to drive the steep drop in stock prices during the crisis. However, a new look at the effects of such restrictions challenges the notion that short sales exacerbate market downturns in this way. The 2008 ban on short sales failed to slow the decline in the price of financial stocks; in fact, prices fell markedly over the two weeks in which the ban was in effect and stabilized once it was lifted. Similarly, following the downgrade of the U.S. sovereign credit rating in 2011—another notable period of market stress—stocks subject to short-selling restrictions performed worse than stocks free of such restraints.

During periods of market stress, it is common to hear calls for restrictions on short-selling, the practice of borrowing shares and then selling them with the intention of repurchasing them later at a lower price. The concern of some market observers is that short-selling may drive stock prices to artificially low levels.

In 2008, as the financial crisis worsened, this concern prompted a number of countries to ban short-selling. Some countries prohibited short sales on all stocks, while others limited the ban to financial stocks. And very recently, in July 2012, certain European countries imposed bans similar to those adopted in 2008.¹

In this edition of *Current Issues*, we investigate whether the short-selling bans of 2008 were effective in stemming the decline of U.S. stock prices. We examine the conjectured link between market downturns and short-selling, then evaluate evidence on the bans' effectiveness in limiting share price declines in 2008. We also explore the costs imposed by these bans.

Our analysis of the empirical evidence from the United States suggests that the bans had little impact on stock prices. Even with the bans in place, prices continued to fall. At the same time, the bans lowered market liquidity and increased trading costs. On the latter point, we estimate that the ban raised total trading costs in the U.S. equities options market by \$500 million² in the period between September 18 and October 8, 2008.

To gain additional evidence on these issues, we also consider the market effects of short-selling in August 2011, when Standard and Poor's (S&P) announced that it was lowering the long-term sovereign credit rating of the United States. At the time, no blanket ban on the practice existed in the United States. Although the S&P 500 fell

¹ Spain and Italy reinstated bans on short-selling on July 23, 2012.

² Boehmer et al. (2009) estimate that the costs in the equity market exceeded \$600 million. Combining this figure with our estimate for the options market brings the increase in total trading costs to more than \$1 billion.

6.66 percent on August 8, the first trading day after the downgrade was announced, our findings suggest that short-selling was not a cause of the market's decline. Indeed, stocks with net short-selling around this time actually had higher returns than other stocks.

What Is Short-Selling?

Short-selling is the selling of borrowed shares by investors who expect to cover their positions later by repurchasing the shares at a lower price. Because of the profit opportunities it presents, short-selling is a common practice. Diether, Lee, and Werner (2009) show that during 2005 it accounted for 24 percent of trading volume on the New York Stock Exchange and 31 percent of Nasdaq trading volume.

Most short sales are conducted by market makers or high-frequency traders, or by options market makers who short to hedge their options positions. Market makers and high-frequency traders generally do not maintain short positions for long periods. In fact, they typically close them within minutes or even seconds of opening them.

Our focus is on investors who short stocks for longer periods because they believe the stocks are overpriced; they expect to profit by repurchasing the stocks after prices have fallen. These investors generally borrow the shares from an institution, often one with a passive investing strategy. In exchange for the stocks, the borrower places collateral, usually cash, with the lender. (The standard collateral for U.S. equities is 102 percent of the shares' value.)

The lender of the stocks pays interest on the collateral at a rate that is negotiated between the borrower and lender—referred to as the *rebate rate*. For stocks that are easy to borrow, rebate rates may range between 8 and 25 basis points below the federal funds rate (large loans typically receive a larger percentage rebate). In the event of a large demand for shares to short or a small supply of shares to be lent, the stock may be hard to borrow—in which case, the rebate rate may be substantially below the federal funds rate. In extreme cases, the rebate rate can even turn negative. The borrower of the stock then pays interest to the lender rather than the other way around.

Short-Selling and Market Declines

From a long-run perspective, stocks that are overpriced relative to their fundamental values present a problem for the economy. The market will eventually correct the mispricing, but in the meantime, real resources may flow to the overpriced stock or industry. And while stocks are liquid financial instruments, the investments in the mispriced firm or industry may not be so liquid, leading to long-term disruptions in the real economy long after the stock price is corrected.

For example, consider the new-technology firms that were caught at the end of the dot-com bubble. While it took only a

short time for the market to correct what were, in retrospect, overpriced technology stocks, the employees, customers, suppliers, and lenders associated with those firms took much longer to react, recover, and return to productivity.

In much the same way, an artificially underpriced stock sends a distorted signal to investors. Capital gets directed toward other investments when it could have been put to better use at the undervalued firm or industry. Accordingly, regulators and economists generally agree that it is good for short-selling to depress stock prices if the stocks are overvalued, but bad if short-selling pushes stock prices below fundamental values.

Short-sellers claim that by identifying overvalued stocks and correcting the mispricing, they provide a valuable service to investors. For example, in his testimony before the House Committee on Energy and Commerce in 2002, short-seller James Chanos, founder of Kynikos Associates, a private investment management company specializing in short-selling, reported that his firm looked for companies that appeared to have materially overstated earnings, that had been victims of a flawed business plan, or that had been engaged in outright fraud.³ Chanos testified that, months before Enron's collapse, he began shorting the firm's stock because of suspicious gain-on-sale accounting, cryptic disclosure of related-party transactions, and an apparent return on investments that was less than the firm's cost of capital.

Despite concerns that short-selling can artificially drive prices below fundamental values, it is not easy for investors to make money in this way. Short sales may depress stock prices, but the short-seller profits only after buying back the shares at low prices to close the position. If purchases and sales have a symmetric impact, such that a sale of shares moves prices down by about the same amount as the purchase of the same number of shares would raise prices, prices will rise to their original levels when the short-seller buys back the shares. In that case, the short-seller will not profit from this strategy and will instead lose money on trading costs.

One way for a short-seller to make a profit shorting a stock that is not overvalued is to somehow fool other investors into selling him the shares at a price that is lower than the one he charged the original investors.⁴ This is a risky scheme, however, and may prove very unprofitable. If the short-seller succeeds in moving prices below fundamental values and investors catch on to his game before he repurchases the shares to cover his short position, the short-seller can suffer substantial losses as investors drive up share prices. Moreover, if short-sellers spread false rumors about a company or attempt to manipulate its share price, they are engaging in illegal activities and the targeted company may fight back.

³ See the prepared testimony of Chanos before the House Committee on Energy and Commerce, "Developments Relating to Enron Corp" (February 6, 2002), available at <http://www.actwin.com/kalostrader/EnronTestimony.htm>.

⁴ Note that this strategy would not work if no-arbitrage conditions held.

Examining 327 disputes between short-sellers and companies, Lamont (2004) finds that, on average, the stocks of the targeted companies underperformed the market the following year by a whopping 24.7 percent. One explanation for these abysmal returns is that the companies' stocks were overpriced and short-sellers successfully ferreted out the mispricing. A second explanation, preferred by managers of the shorted firms, is that short-sellers continued to drive prices even further below fundamental values after companies fought back. Lamont, however, finds this explanation unconvincing because "many of the sample firms are subsequently revealed to be fraudulent."

In addition, investigations into the activities of the short-sellers were requested by sixty-six of Lamont's sample firms. As Lamont notes, if the Securities and Exchange Commission (SEC) had found that these short-sellers were spreading false rumors, manipulating prices, or committing other illegal acts, their criminal activity would have been revealed and the stock would have rebounded. In fact, the companies that requested investigations earned abnormal returns of -27.7 percent the following year.

Another way in which a short-seller can profit from shorting a stock that is correctly priced is by weakening investor confidence in the firms whose stocks are shorted. This seems to have been a concern of the SEC when it imposed the 2008 ban on short sales.⁵ Financial firms whose soundness has been called into question in this way might be required by counterparties to post additional or higher-quality collateral. They might even find that other companies have decided to stop lending securities to them or trading with them altogether. Of course, this would be an efficient outcome—and one that limits systemic risk—if the stock price of such a firm was low because the business was unsound. But if the stock price was driven to artificially low levels because of short-selling, the outcome would be an adverse one.

Still, it might take time to damage a financial firm in this way. Prices may need to be held artificially low for an extended period. Moreover, the firm would have an interest in convincing investors of the soundness of its assets. If other smart investors believed that the financial firm's assets were solid, they would trade against the short-sellers, making the shorting strategy a risky one.⁶

⁵ See the SEC press release of September 19, 2008, which states, "It appears that unbridled short-selling is contributing to the recent, sudden price declines in the securities of financial institutions unrelated to true price valuation. Financial institutions are particularly vulnerable to this crisis of confidence and panic selling because they depend on the confidence of their trading counterparties in the conduct of their core business." The press release is available at <http://www.sec.gov/news/press/2008/2008-211.htm>.

⁶ A Google Scholar search using the string "short sales market manipulation" identified few academic articles that document a meaningful relationship between manipulative short-selling and large stock price declines. Along these lines, Macey, Mitchell, and Netter (1989) conclude that "it is unlikely in today's highly developed market that 'bear raids' could seriously disrupt the workings of the market."

Are Short-Selling Bans Effective in Preventing Market Declines?

It is important to consider the consequences of short-selling not just under normal market conditions, but also in periods of market stress. Regulatory actions implemented in recent years in a number of countries have given researchers new opportunities to test whether bans on short sales have muted or prevented market downturns.

In the fall of 2008, the prices of financial stocks declined sharply throughout the world. The United States and several other countries responded by imposing bans on short-selling of financial stocks. In perhaps the most comprehensive analysis of these bans, Beber and Pagano (2011) examine the effects of short-selling bans in thirty countries between January 2008 and June 2009. Focusing on the countries where short-sale bans did not apply to all stocks, Beber and Pagano compare the median cumulative excess returns for stocks that were subject to the ban and stocks that were not. They compute excess returns by taking the difference between individual stock returns and the respective equally weighted country index. They then cumulate the daily excess returns immediately after the imposition of the short-sale ban, presenting their results separately for the United States and the rest of the world.

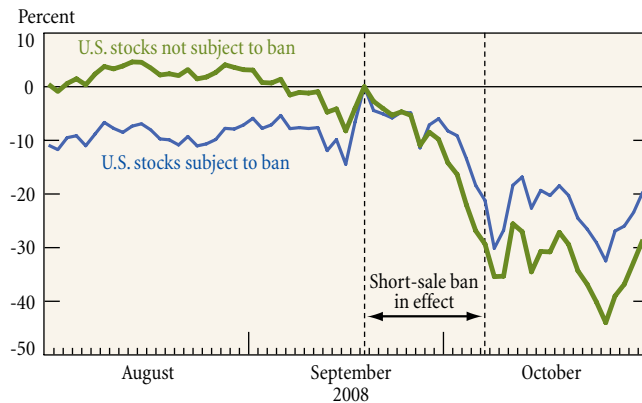
In the end, Beber and Pagano find that U.S. financial stocks generated positive abnormal returns (relative to the market) during the short-sale ban, a result consistent with the argument that the bans keep stock prices from declining. However, they note that this effect may be due to legislative efforts intended to support U.S. financial institutions during that period, such as the Troubled Asset Relief Program (TARP). Consistent with this assertion, they find that for countries where short-selling bans were not accompanied by legislative efforts of this kind, the excess returns generated by the stocks subject to short-sale bans were similar to the returns generated by the stocks that were free of bans. The authors conclude that imposition of short-sale bans in 2008 and 2009 was "at best neutral in its effects on stock prices."

To further explore the impact of the short-sale ban on U.S. financial stocks, we examine cumulative daily returns for the 995 financial stocks subject to bans during 2008. Daily holding-period returns are obtained from the Center for Research in Security Prices, and cumulative returns are equally weighted across stocks. Since almost all financial stocks were targeted by the ban, it is difficult (if not impossible) to find an appropriate benchmark against which to evaluate their returns. In the absence of a better choice, we present the cumulative daily returns of an equally weighted portfolio of U.S. nonfinancial stocks that were not subject to the short-sale ban.

In the days preceding the September 19 ban, the prices of financial stocks were under stress (Chart 1). The large negative return on September 15 occurred on the day that Lehman Brothers filed for Chapter 11 protection. Subsequently, there were large

Chart 1

Equal-Weighted Cumulative Returns for U.S. Stocks August 1, 2008–October 31, 2008



Source: Daily return data: Center for Research in Security Prices.

Note: Cumulative returns are equally weighted across stocks and are normalized to zero on September 14, 2008.

positive returns on Thursday, September 18 (the day before the ban was imposed), and Monday, September 22 (the first trading day following the ban); nevertheless, as Beber and Pagano note, other developments during this brief interval might have buoyed returns. For example, on September 20, the U.S. Treasury Department submitted draft legislation to Congress asking for authority to purchase troubled assets.⁷

Moreover, despite the large positive returns associated with the initiation of the short-sale ban, the prices of financial stocks fell more than 12 percent over the fourteen days during which the ban was in effect. Shortly after the ban was lifted, however, the prices of financial stocks stabilized. This result accords with Beber and Pagano's finding that steep market declines continued in the countries where short-sale bans remained in effect during 2008 and 2009.

Evidence from the U.S. Bond-Rating Downgrade

The largest decline in U.S. stock prices since 2008 occurred after Standard and Poor's announced that it was downgrading its rating of U.S. Treasury bonds from AAA to AA+. The announcement came after the markets closed on Friday, August 5, 2011. On Monday, August 8, U.S. stocks fell sharply, with the S&P 500 index declining 6.66 percent. In this case, there was no blanket ban in effect on short-selling; short-sale restrictions were applied only selectively. So how much of this decline, if any, can be attributed to short-selling?

The short-selling most likely to have an impact on prices involves the long-term bets on price declines, not short-selling

⁷ See U.S. Department of the Treasury, "Text of Draft Proposal for Bailout Plan," available at http://www.nytimes.com/2008/09/21/business/21draftcnd.html?_r=1&ref=business&oref=slogin.

undertaken as part of market-making activities. These longer-term sales appear in biweekly totals of all of the shares held short, also called short interest. To measure short-selling's impact on stock prices at the time of the bond-rating downgrade, we follow the practice of the empirical literature on this topic and regress U.S. stock returns from July 29 to August 15 on a normalized measure of the change in short interest over that period.⁸

The change in short interest is calculated as the short interest on August 15 minus the short interest on July 29 divided by the average short interest across the two days. We divide by the average short interest to normalize the change in short interest, a step that limits the change to a range of -2 to +2. For a stock to be included in our regressions, it must have positive short interest on one or both of the August 15 and July 29 dates.

Table 1 provides summary statistics on the distribution of changes in short positions and returns between July 29 and August 15, 2011. Short interest did indeed increase for most stocks over this period, and returns were negative for more than three-quarters of the stocks.

We see, however, considerable variation across stocks in terms of changes in short interest. More than a quarter of the firms actually reported a decrease in short interest. For them, short-sellers were net purchasers of stock during this period.

Table 2 reports ordinary least squares regressions of stock returns on changes in short interest. If short-sellers were responsible for the decline in prices, we would expect to see lower returns for stocks experiencing larger increases in short interest. Instead, stocks with larger increases in short interest had *higher* stock returns over this period.

As the table shows, the correlation between short-selling and stock returns is low. The first row of the table reports regression results for the full sample of stocks (1,843 stocks). The intercept (-0.0957) and the coefficient of change in short interest (0.0298) are both significant, with *t*-statistics of -43.03 and 3.72, respectively. The adjusted R^2 —a measure of the degree to which short sales can explain the drop in return—is only 0.0069. When we restrict our estimates to stocks with prices of five dollars or more (1,611 stocks)—see row 2—we still obtain a coefficient for the change in short interest (0.0277) that is positive and statistically significant (the *t*-statistic is 3.43).⁹ The adjusted R^2 for the specification in row 2 is again only 0.0066. To make sure that the results are not affected by stocks with a small number of shares shorted, and consequently with a large percentage change in short-selling, we rerun the regressions using stocks with at least

⁸ Using short interest as a proxy for short-sale demand, Asquith, Pathak, and Ritter (2005) find that stocks that were short-sale-constrained underperformed during the 1988-2002 period by 2.15 percent per month on an equal-weighted basis.

⁹ Short-sale bans usually only ban "naked" short sales or short sales in cash markets. It is usually possible for more sophisticated market participants to construct synthetic short positions by selling at-the-money calls and buying at-the-money puts. This may be a factor in the low correlation between levels of short interest in cash markets and stock returns.

Table 1

Distribution of Changes in Short Positions and Returns

	10 percent	25 percent	Median	75 percent	90 percent	Mean
Change in normalized short interest	-0.1714	-0.0438	0.0493	0.1550	0.3063	0.0605
U.S. stock returns	-0.2023	-0.1440	-0.0870	-0.0377	0.0029	-0.0939

Sources: Data on short interest: New York Stock Exchange. Data on U.S. stock returns: Center for Research in Security Prices.

Notes: Data on short interest cover stocks listed on the New York Stock Exchange and the American Stock Exchange in the period from July 29, 2011, through August 15, 2011. The change in short interest is calculated as the short interest on August 15 minus the short interest on July 29, divided by the average short interest across the two dates.

Table 2

Ordinary Least Squares Regression of Stock Returns on Changes in Short Interest

	Intercept	<i>t</i> -statistic	Change in Short Interest	<i>t</i> -statistic	Adjusted R^2	Number of Stocks
All stocks	-0.0957	-43.03	0.0298	3.72	0.0069	1,843
Stocks \geq \$5	-0.0927	-41.77	0.0277	3.43	0.0066	1,611
Stocks with 1,000,000 or more shares short	-0.1027	-40.30	0.0624	4.79	0.0166	1,306

Source: Data on U.S. stock returns: Center for Research in Security Prices.

Notes: U.S. stock returns are cumulated from July 29, 2011, through August 15, 2011. The change in short interest is calculated as the short interest on August 15 minus the short interest on July 29, divided by the average short interest across the two dates.

Table 3

Ordinary Least Squares Regression of Stock Returns on Short-Sale-Restricted Stocks

Intercept	<i>t</i> -statistic	Short-Sale-Restricted Stocks	<i>t</i> -statistic	Normalized Volume	<i>t</i> -statistic	Adjusted R^2	Number of Stocks
-0.0836	-68.97	-0.0216	-5.12	—	—	0.0131	1,905
-0.0844	-49.41	-0.0217	-5.14	0.0044	0.07	0.0128	1,611

Source: Data on U.S. stock returns: Center for Research in Security Prices (CRSP).

Notes: U.S. stock returns are cumulated from July 29, 2011, through August 15, 2011. The regression results in row 2 of the table control for volume. We accumulate the daily trading volume for each day in September to obtain the September volume; the trading volume for each stock on August 8 is reported by CRSP.

1 million shares short on both dates (1,306 stocks). As reported in row 3, the adjusted R^2 remains a small 0.0166. Changes in short interest, then, do not explain much of the stock price decline around the time of the bond-rating downgrade. Indeed, returns are slightly higher for stocks showing large changes in short-selling—exactly the opposite of what we would expect if short-selling was pushing down prices.

In February 2010, the SEC adopted circuit-breaker restrictions on short-selling. Short-selling of a stock that declined 10 percent or more is allowed only at prices higher than the national best bid. This restriction holds for the entire day in which the circuit breaker is triggered and for the following day as well. For an alternative way of examining the impact of short-selling on returns following the bond-rating downgrade, we assess the returns of stocks with restricted short-selling against the returns of stocks without circuit-breaker restrictions on shorting. We create a dummy variable for stocks that triggered the short-sale restriction on Friday, August 5 (before the downgrade was announced), and

were thus under circuit-breaker restrictions on short-selling on August 8. We then regress each stock's August 8 return on the short-sale restriction dummy. In a second set of regressions, we include August 8 volume divided by September volume as a second explanatory variable.

The results for the first set of regressions are reported in Table 3, row 1. Stocks subject to short-selling restrictions actually performed worse on August 8 than the stocks without restrictions in place at the beginning of trading; the coefficient on the dummy variable capturing short-sale-restricted stocks is -0.0216, with a *t*-statistic of -5.12. The second set of regressions, in which we control for volume, yields similar results (row 2). Again, stocks subject to short-selling restrictions underperformed stocks not covered by restrictions; the coefficient is -0.0217, with a *t*-statistic of -5.14. Here, as with the short-interest results, basic correlations do not support the conjecture that short-selling was associated with the sharp decline in U.S. stock prices on August 8.

Costs of Short-Selling Bans

The equity markets provide telling evidence of the costs imposed by short-sale bans. In their multivariate analysis, Boehmer, Jones, and Zhang (2009) find that the 2008 short-sale ban in the United States was associated with a 32 basis point increase, on average, in relative effective bid-ask spreads for the banned stocks. For the 404 financial stocks that were subject to the ban for its duration—September 18 through October 8, 2008—the increase in spreads represents an increase in liquidity costs of more than \$600 million.¹⁰

This estimate of costs does not include those that arise from mutually beneficial trades that did not occur because of the inflated liquidity costs. Beber and Pagano, analyzing the impact of 2008 short-selling bans on equity trading costs for seventeen countries, demonstrate that investors in foreign equity markets were also harmed financially by short-sale bans.

The liquidity and opportunity costs associated with the bans were not confined to equity markets, however. In the United States, for example, the ban was initiated on a “triple witching” Friday (when contracts for stock index futures, stock index options, and stock options expire on the same day). While market makers in U.S. derivatives markets were initially exempt from the short-sale ban, their exemption was scheduled to expire at 11:59 p.m. on Friday, September 19. Thus, market makers presumed they would be unable to short stock to hedge their risk after the close of trading on Friday. Accordingly, they were reluctant to take on positions and almost brought about the closing of the options markets. By midday on September 19, several options market makers had threatened to stop trading entirely if their short-selling exemption was not extended.

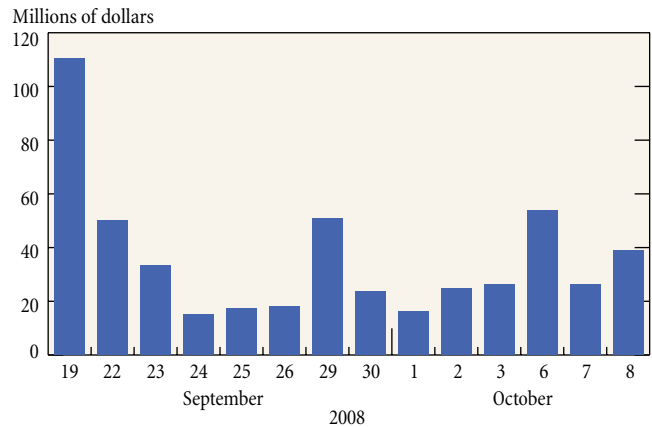
The SEC was responsive to their complaints. Before the opening of the markets on Monday, September 22, the SEC extended the short-selling exemption to market makers in derivatives markets. However, as noted by Battalio and Schultz (2011), it took several more trading days for the SEC to relax or clarify other components of the prohibition on short sales that were seen as overly restrictive by many market participants.

How did the options markets respond to this regulatory action? In their multivariate analysis, Battalio and Schultz find that puts and calls on banned stocks with October expirations had quoted spreads that were more than \$0.96 wider than the quoted spreads of their control sample, which consisted of options on stocks with unrestricted short-selling. They also find that the quoted spreads of options on banned stocks remained elevated by an average of 10 percent for the remainder of the short-sale

¹⁰ This figure is estimated from the statistics presented in Table 2 and also in Panel A of Table 4 in Boehmer, Jones, and Zhang (2009). It is computed as follows: Average dollar trading volume for a stock subject to the short-sale ban is \$66,749,000. We multiply this figure by 404 (the number of financial stocks subject to the ban for its duration), by 16 basis points (the increase in relative effective half-spreads), and finally by 14 (the number of days the ban was in effect).

Chart 2

Increased Trading Costs Paid by Investors Trading Options on Stocks Subject to the Short-Sale Ban September 19, 2008–October 8, 2008



Sources: Battalio and Schultz (2011); authors' calculations.

ban. Drawing on Battalio and Schultz's findings, we are able to estimate the daily increase in trading costs paid by liquidity-demanding investors in options markets during the short-sale ban (Chart 2).¹¹

On September 19, options market makers were unsure if they would be able to hedge their positions by shorting stock for the remainder of the ban. Thus, it is not surprising that liquidity-demanding investors paid more than \$110 million in inflated liquidity costs on that Friday, as indicated by the first bar in Chart 2. The other bars in the chart suggest that the inflated costs did not disappear once the options market makers were granted their exemption from the short-sale ban. Battalio and Schultz attribute these costs to the regulatory uncertainty that prevailed during this period. Summing across the fourteen days of the short-sale ban produces an estimate of more than \$505 million in inflated liquidity costs during that time.

Together, the inflated costs of liquidity attributable to the short-sale ban in U.S. equity and options markets are estimated to exceed \$1 billion. And, as noted earlier, this estimate ignores the lost gains from those trades that would have been made had bid-ask spreads been at or close to normal levels. The estimate also ignores the costs imposed on other markets. For example, convertible-bond arbitrageurs purchase more than 75 percent of primary issues of convertible debt (Choi et al. 2010) and hedge their purchases by shorting shares of stock. When the short-sale ban was imposed, the market for convertible bonds dried up (see Barr [2008]).

¹¹ Battalio and Schultz's regression results are presented in the appendix to their article, available online at <http://www.afajof.org/journal/abstract.asp?ref=0022-1082&vid=66&iid=6&aid=6&cs=-9999>. We calculate the daily increase in trading costs by multiplying daily trading volume in banned options by one-half of the authors' estimate of each day's marginal spread.

Conclusion

In September 2008, at a time of intense market stress, the United States and a number of other countries banned the short-selling of financial stocks. The bans were imposed because regulators feared that short-selling could drive the prices of those stocks to artificially low levels. Yet much remains to be understood about the effectiveness of such bans in stabilizing equity market prices. And reexamination of this issue is particularly important in light of the latest wave of bans in Europe, including the restrictions imposed by Spain and Italy in July.

Recent research on the 2008 bans allows us to assess the costs and benefits of short-selling restrictions. The preponderance of evidence suggests that the bans did little to slow the decline in the prices of financial stocks. In addition, the bans produced adverse side effects: Trading costs in equity and options markets increased, and stock and options prices uncoupled.

No blanket short-selling ban was in effect during August 2011, when Standard and Poor's announced its downgrade of the U.S. bond rating. Our look at the sharp fall in U.S. equity prices following the announcement uncovers no evidence that the price decline was the result of short-selling. Indeed, stocks with large increases in short interest earned higher, not lower, returns during the first half of August 2011. Moreover, stocks that had triggered circuit-breaker restrictions and therefore could not be shorted on the day the downgrade was announced actually had lower returns than the stocks that were eligible for shorting.

Taken as a whole, our research challenges the notion that banning short sales during market downturns limits share price declines. If anything, the bans seem to have the unwanted effects

of raising trading costs, lowering market liquidity, and preventing short-sellers from rooting out cases of fraud and earnings manipulation. Thus, while short-sellers may bear bad news about companies' prospects, they do not appear to be driving price declines in markets.

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