

*Naked shorting is little different from permissible shorting.*

# The Economics of Naked Short Selling

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**S**ecurities and Exchange Commission regulations define a “short sale” to “mean any sale of a security which the seller does not own or any sale which is consummated by the delivery of a security borrowed by, or for the account of, the seller.” That is, a short seller sells shares he does not own; instead, he delivers to the buyer shares that are borrowed from a shareholder. Later, the seller must “cover” the loan — he must buy shares and deliver them to the lender. Short sellers operate when they believe the price of a security will fall — in essence, they sell borrowed shares today at a high price and then pay back the lender with lower-priced shares in the future.

Many financial economists believe that some short selling is necessary to prevent prices from reflecting only the views of the most optimistic investors in the market. In doing this, short sellers moderate prices both when they are shorting and when they later cover. Nonetheless, short selling has long been unpopular with security owners because they believe it can depress stock prices. There is little if anything security owners can do to prevent permissible short selling.

A broker/dealer can accept a short sale order from a customer or effect a short sale for its own account so long as it meets the following conditions:

- It has borrowed the security or made a good faith arrangement to borrow the security, or

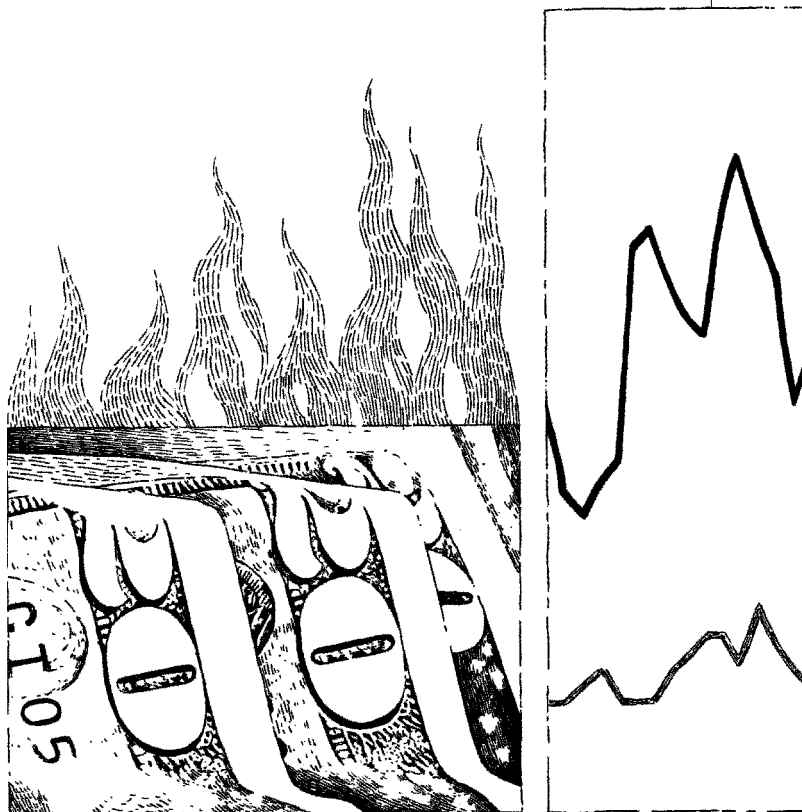
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- It reasonably believes it can locate and borrow the security by the settlement day, and
- It has documented compliance with either of the above two requirements.

Some forms of short selling are illegal. When a seller sells stock short but has not borrowed the security or made a good faith



arrangement to borrow the security, or does not reasonably believe it can borrow the security by the settlement day, the short seller is probably engaged in impermissible “naked” short selling.

Naked short selling has been the focus of an increasing number of lawsuits. One plaintiffs’ lawyer prosecuting these suits argues that the practice is “the largest commercial fraud in U.S. history, involving hundreds of billions of dollars.” Outside the legal community, those decrying the practice range from fervently opinionated individual investors to the U.S. Chamber of Commerce, which asked the SEC in January 2007 to take additional steps to stop naked short selling. Regulators and exchanges have shown a willingness to crack down on alleged violations of prohibitions on naked short selling.

Despite the cries of alarm, we believe that naked short selling is unlikely to have significant detrimental effects on capital markets. In this article, we will first examine the relevant economics and regulation, and then argue that, from an economic perspective, naked shorting is little different from traditional shorting.

### THE ECONOMICS OF SHORT SELLING

The conventional wisdom is that short selling drives down the price of the stock being sold. The SEC often receives excited opposition to the practice of short selling, much of which invokes accusations of conspiracy theory and nearly religious fervor against short selling in general and naked short selling in particular. At the same time, financial economists long have been skeptical of the value of regulations that constrain speculative short selling because of a conviction that short sale constraints may allow overpriced securities to remain overpriced.

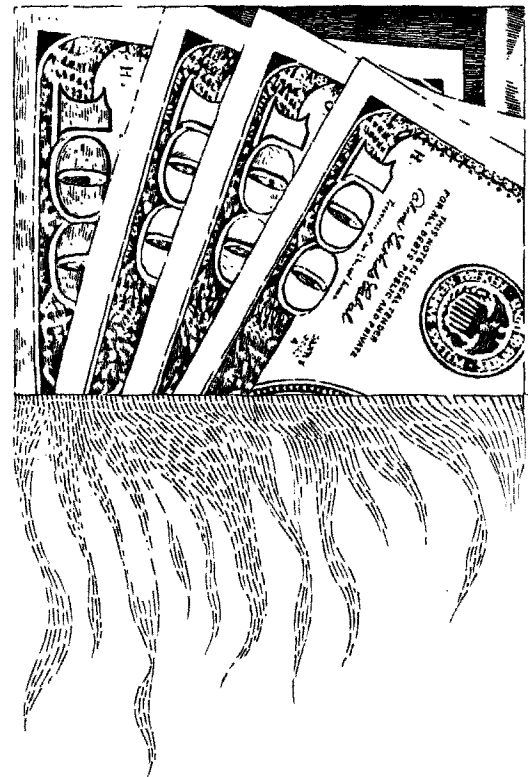
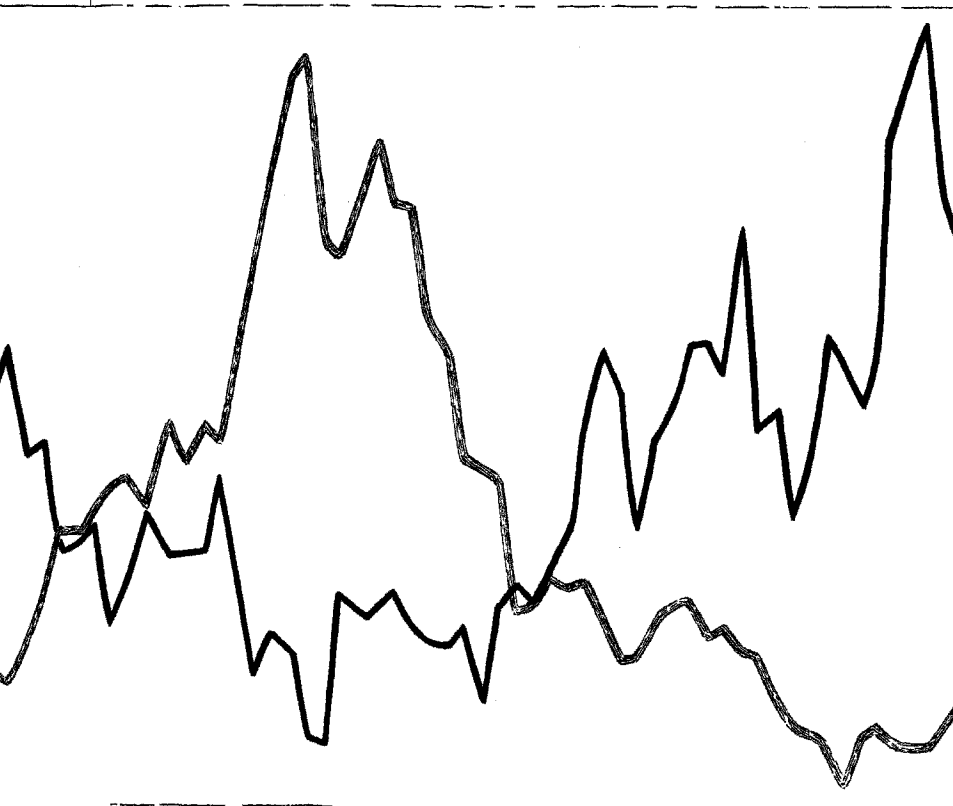
**THE GOOD SIDE** Prices are socially valuable signals. Short sell-

ing can correct irrational overpricing if and when it occurs and, for that reason, financial economists usually object to regulatory constraints on short selling.

In Figure 1, the shares outstanding before any short selling are fixed at quantity  $Q^0$ . The curve labeled  $D^0$  is an “excessively optimistic” demand curve. Before any short sales, the price that clears the market at the existing supply of shares is  $P^0$ . A short sale can be viewed as a short-term increase in the supply of the stock – say, from  $Q^0$  to  $Q^{0+s}$ . The market-clearing price at this “as-if” quantity is  $P^{0+s}$ , which is lower than  $P^0$ .

In this example, short selling depresses prices. But that alone cannot make short selling profitable and, therefore, does not provide an incentive for speculative short selling. In particular, the price decrease is only temporary if demand does not fall at given prices, because it will disappear when the short seller covers the short. If the demand curve remains fixed at  $D^0$ , then the short’s effect on prices unravels when he covers, leaving him with no profits. When the short seller buys back the shares to cover his short position, he decreases the apparent supply from  $Q^{0+s}$  back to  $Q^0$  and the price moves back to  $P^0$ , wiping out the price decrease.

In order for short selling to be profitable, there must be a future downward shift in demand, as from  $D^0$  to  $D^{0-s}$  in Figure 1. If this downward shift occurs, then the short seller can profit when he covers his short sales. He sold short for proceeds of  $P^{0+s} \times (Q^{0+s} - Q^0)$  – i.e., the market-clearing price for the short sale times the quantity of shares sold short. It will cost him less than that after the downward shift in demand to cover his short,  $P^{0-s} \times (Q^{0+s} - Q^0)$ , leaving profit of the difference  $(P^{0+s} - P^{0-s}) \times (Q^{0+s} - Q^0)$ . But the short position is profitable only because the demand curve shifts down for reasons unrelated to his short selling, not



because short selling forces it down. Speculative short selling is a bet on a downward shift in demand, but short selling, by itself, does not cause the downward shift. The short seller cannot profit from the decrease in prices that his short selling causes unless a shift in demand occurs.

The potential social benefit of short selling is that it forces prices today closer to the amount that reflects the intersection of supply and demand later, if we assume that the current demand is excessively optimistic and will shift to a more rational (i.e., lower) level. Indeed, short sellers will have an incentive to pursue their strategy until there is no more profit available from the strategy. This will force profits today to move toward what they should be in the future, as Figure 2 illustrates. If short sellers forecast a fall in demand from  $D^0$  to  $D^{0-s}$ , they will continue short selling until the price at demand  $D^0$  with short selling equals the price at demand  $D^{0-s}$  once they have covered their shorts — i.e., without short selling. If the shorts are correct, unconstrained short selling will drive prices today to the levels that the prices will reach under the new demand  $D^{0-s}$ . If we think of demand  $D^0$  as excessively optimistic and demand  $D^{0-s}$  as more rational, short selling allows the price at demand  $D^0$  to be the same as it will be under demand  $D^{0-s}$ .

**THE BAD SIDE** Current security owners' objection to short selling is easy to see, and such objections are not wholly without merit from their perspective. Short selling, after all, does affect the price at which existing security owners can sell today. If demand curves for securities are downward sloping, then short selling generates prices that are lower than they would be if only the outstanding securities were available for trade in the market. As long as the current demand curve  $D^0$  reflects existing demand for the security, the amount of the short selling will depress the price by virtue of the “as-if” increase in quantity. This price decline has a real impact on the ability of existing share owners to sell their shares. The short selling has already satisfied the latent demand of all the marginal buyers from  $P^0$  to  $P^{0+s}$ .

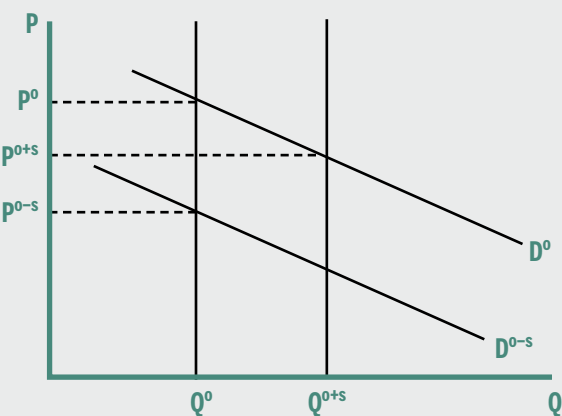
The marginal seller among existing security owners is clearly worse off after the short sale than before. Before the short sale, the marginal owner/seller would be able to sell at a bit below  $P^0$ . After the short sale, the marginal owner/seller would have to sell at a bit below  $P^{0+s}$ , which is less than  $P^0$ . Short selling allows a non-owner to satisfy demand from  $P^0$  to  $P^{0+s}$ .

Short selling also generates trading prices that do not reflect the willingness of existing owners to sell at the prices generated by the short sales. In securities markets, a sale price conveys socially valuable information about the minimum value that the marginal buyer places on owning the security sold. If the seller is an existing security owner selling from his current holdings of the security, the sale also reveals that the new buyer values that security more than the selling owner (setting aside liquidity needs that may require a seller to sell despite his or her valuation). But if the seller is a speculative short seller, the sale reveals something different. In particular, a speculative short sale generates the minimum value that the marginal buyer places on the security, just as would be the case in a sale by an existing security owner. But although the speculative short sale allows us to conclude

Figure 1

### Economics of Short Selling

Shifts in demand and supply associated with shorting



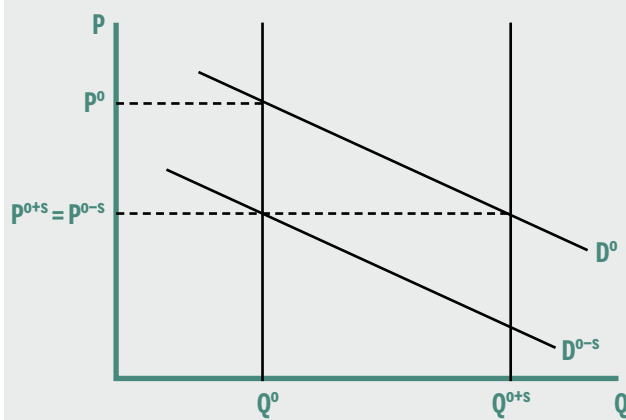
that the speculative short seller values the security less than the new buyer, we cannot conclude that any existing security owner values the security at less than the price struck in the short sale. Of course, this is why speculative short selling is risky for the seller. The speculative short seller must, at some point, find a current owner willing to sell at below the price struck in the speculative short sale to cover the short. Otherwise, the speculative short seller will incur a loss.

Finally, and perhaps most relevant from a social cost/benefit perspective, short selling will generate price volatility even when short sellers are incorrect about future demand for the security. If demand stays fixed at demand curve  $D^0$ , then short selling can generate price changes from  $P^0$  to  $P^{0+s}$  at the short sale, and then from  $P^{0+s}$  back to  $P^0$  when the short sale is unwound. In this manner, short sellers can bounce the price back and forth. Because they only lose transactions costs in the process, short sellers can — innocently or deliberately — induce heightened price volatility. Importantly, that volatility is unre-

Figure 2

### Moderating Prices

Short selling pushes excessively optimistic demand toward more rational levels.



lated to any changes in economic fundamentals of the economy at large or the security in isolation. Just as society benefits when short sellers generate prices better reflective of rational demand, some parts of society may lose when short sellers generate price volatility unrelated to fundamental valuation.

**ON BALANCE** Do the social benefits of speculative short selling (primarily the possibility of generating discovery of more rational prices for overpriced securities) outweigh the costs (primarily the possibility that prices do not reflect the intersection of rational demand at the true supply of physical shares)? This is an empirical question and the evidence is mixed and consistent with both arguments. Short selling does seem to improve the pricing of some securities, while simply making others more volatile. Those effects are hard to disentangle.

Empirical evidence shows that stocks with the highest idiosyncratic volatility (i.e., volatility unrelated to market-wide factors) are also those securities that appear to be most consistently overpriced using the best available financial economic tests. Anecdotal evidence exists that the overpricing of individual stocks in some financial markets may be connected to constraints on short sales. But short selling may do little to correct mispricing in the overall stock market.

Empirical evidence on the relation between short selling and overpricing is weak, but numerous problems complicate any clear determination of the effect short selling has on securities prices. In principle, firms whose stocks are easy to short should be better priced than firms with shares that are very difficult to short. But short interest — the fraction of securities outstanding that are currently shorted — is a weak predictor of subsequent returns. Reliable proxies that measure the difficulty of short selling, moreover, are hard to find. One such proxy is breadth of ownership. Empirical evidence does suggest that stocks with narrow ownership — likely composed of the most optimistic investors — might be subject to binding short sale constraints, and such stocks perform poorly on average.

### THE REGULATION OF SHORT SELLING

The SEC regulation requiring that short sellers arrange to borrow the security that they are shorting, or have reasonable grounds to believe they can borrow the security, is known as Regulation SHO. To better appreciate Regulation SHO, we need to understand the legal status of security ownership — that is, the nature of the property right that security owners have in a security. We must also understand the securities clearing and settlement process in the United States.

Nearly everyone but the most knowledgeable and technically precise insider speaks of “owning a security,” but equity investors in publicly traded corporations in the United States usually own something different from a “security.” As a rule, investors have a “security entitlement” as defined in Article 8 of the Uniform Commercial Code to mean “the rights and property interest of an entitlement holder with respect to a financial asset.” As the Reporter for the Revised Article 8 has written:

The commercial development that gave rise to the present revision of Article 8 is the evolution of a system in

which the important evidence of ownership of securities is not definitive paper certificates, but accounting entries on the records of chains of intermediaries. Using a new word — security entitlement — to describe the package of rights that one obtains when such accounting entries are made is very much like using a new word — stock certificate — to describe the package of rights that one obtains by taking delivery of a special form of paper that embodies underlying rights.

Security entitlements are different in important ways from securities. In particular, security entitlements reflect the fact that record ownership of security certificates typically is held by the Depository Trust Company (DTC) in the name of Cede & Co., its nominee, and not by investors. Most shares listed on major U.S. exchanges are dematerialized, immobilized, and held in custody accounts at the DTC. The DTC holds those stock certificates that are still physical in its vault. Much as a checking account is really a legal claim on the bank and not literally ownership of cash, a security entitlement is a legal claim against an intermediary in the chain that eventually leads to the DTC and security certificates.

The DTC is one of two corporations central to understanding clearance and settlement of securities trades in U.S. public markets. The other is the National Securities Clearing Corporation (NSCC). Both the DTC and the NSCC are subsidiaries of the Depository Trust and Clearing Corporation.

Ownership of security entitlements is recorded in participant accounts at the DTC. Participants primarily are broker/dealers. The DTC records the security entitlements of its participants against the securities legally owned by the DTC. In turn, participants keep track of the security entitlements of their customers in the security entitlements of the participants. The customer security entitlements are what many people think of as security ownership.

Trades in securities usually occur on exchanges and are reported to, cleared, and settled by the NSCC. The NSCC sends and receives information to and from the DTC to move security entitlements to and from their new owners. The NSCC updates trades through the trading day for each member in each security, and the NSCC communicates the net long and short positions of its members in each security to the DTC. Participants in the DTC are typically also members of the NSCC. The NSCC stands between traders to help eliminate counterparty risk.

Consider a typical sale by a current security owner to a buyer. The current owner sends orders to his broker/dealer to sell the security. The broker/dealer then executes a trade with another broker/dealer or a specialist on an exchange. The trade obligates the seller to have a security entitlement in the sold shares on the settlement date and requires the buyer to pay. Information on the trade is sent to the NSCC. The settlement date is three days after the trade date.

When it comes time for the NSCC to settle the netted positions, the selling member’s stock account at the DTC is debited and a corresponding credit is issued to the purchasing member’s stock account at the DTC. No physical shares actually are exchanged. At the end of the settlement day for the



transaction, the former owner has cash and the buyer has a security entitlement reflecting “ownership” in the security.

**A SHORT SALE** Now consider a short sale where the seller has located shares as required by Regulation SHO. As with a sale by an existing owner, the short seller and buyer consummate a transaction on the trade date that obligates the seller to have a security entitlement in the sold shares on the settlement date three days hence. The difference is that with a short sale, the seller does not yet possess the security entitlement. Instead, the seller — or, more likely, his broker/dealer — tries to locate and borrow the security from a security lender. The short seller then enters into an agreement with a current owner of the security entitlement to acquire the current owner’s security entitlement in return for an obligation to deliver back an equivalent security entitlement whenever the current owner demands it. The short seller can then deliver the acquired security entitlement to the NSCC to discharge its delivery obligations. This transaction satisfies Regulation SHO as long as the broker/dealer did not accept the short sale order without borrowing the security or entering into a bona fide arrangement to borrow the security, or had reasonable grounds to believe that the security could be borrowed so that it could be delivered on the settlement date.

Now suppose that our broker/dealer did not enter into a bona fide arrangement to borrow the security and did not have reasonable grounds to believe that the security could be borrowed so that it could be delivered by the settlement date. When no delivery occurs by settlement, the result in the clearance and settlement system is a “fail to deliver.”

The NSCC has an automatic process for resolving failures to deliver. The system first looks at the selling member’s stock account at the DTC. If the selling member has enough shares of the security in its account, the NSCC uses those shares. If the member does not have enough shares in its account to cover the position, the NSCC can try to use its Stock Borrow Program (SBP).

Under the SBP, NSCC members may opt to “lend NSCC available stocks and fixed income securities from their account at [DTC] to cover temporary shortfalls in NSCC’s Continuous Net Settlement (CNS) System.” At the end of each business day, NSCC members notify NSCC as to which stocks they own that are available for borrowing in the SBP. During the CNS processing cycle each night, positions that remain open and unfilled are compared with stocks available in the SBP for borrowing by the NSCC. The NSCC then uses those shares to make delivery to members with open positions. The member acquires the security entitlement in the borrowed shares — just as it would in any cash transaction that settles the regular way — including the right to vote the shares, receive dividends, resell them, or lend them (e.g., back to the NSCC through the stock borrow program). Shares are often unavailable, however, for securities that are most popular with naked short sellers.

The selling member, of course, continues to have an open delivery obligation to the NSCC, and that selling member does not receive funds until the shares are delivered. In turn, the long member’s funds remain with the buyer until delivery. The long member may initiate a “buy-in” against the system. The member then has another two days to satisfy its delivery obli-

gation and, if it does not, the NSCC can buy the shares itself and charge the account of the member that failed to deliver.

### NEAR-ECONOMIC EQUIVALENCE

There is little meaningful economic difference between the two forms of short selling. Naked short selling simply switches the identities of the party owed shares and the party currently owning shares. In permissible short selling, the party owed shares is the security lender (who used to own the shares before lending them for short selling), while the party owning the shares is the new buyer. In naked short selling, the party owed the shares is the new buyer, while the party owning the shares is (still) the current owner. The buyer in both cases is the same, so the price should not be different. The only difference is who acts as the effective lender of the security: in permissible short selling, the lender is the current owner; in naked short selling, the new owner acts as the effective lender. From a price perspective, it is difficult to see how that matters.

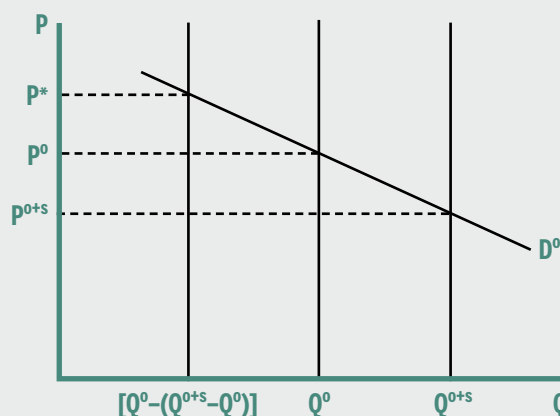
True, unlike the security lender in a traditional short sale, the buyer did not voluntarily enter into the security lending relationship and will, in general, not be compensated except by earning interest on the proceeds of the payment that he retains until delivery of the security. But this difference is not so objectionable. The buyer, after all, is now in the position of the security lender and has a very solvent counterparty in the NSCC. The buyer also may be enjoying an opportunity to buy that otherwise would not exist if the security was unavailable for borrowing from a current owner. And because the security can always be bought-in, this particular buyer can always obtain the actual security if he so desires.

The means by which naked short selling enables a buyer to provide security lending services back to the short seller is, in our view, the essence of what naked short selling is all about. Namely, naked short selling combined with a “fail to receive” alleviates the security borrowing problem by allowing the short seller to borrow shares de facto from the stock buyer rather than the current share owner. For securities that are heavily demanded for short selling, locating securities for deliv-

Figure 3

### Larger Bounce

How naked shorting can increase volatility.



ery at the settlement of a short sale can be very difficult and costly. Unlike deep and centralized markets for long positions in common stocks, no such deep and centralized markets exist to match those willing to lend their securities for short selling.

Interestingly, recent empirical research shows that options market makers begin naked short selling when the rebate rate paid to them (i.e., the amount they receive on the proceeds of the short sale in a permissible short sale) starts to fall, and especially when they would otherwise have to pay interest to the security lender. Naked short selling creates competition in the market for security lending by allowing a new buyer to provide the service of being owed the share rather than allowing only the current owner to do so. To the extent that competition in the securities lending market is desirable — and it is difficult to argue that it is not desirable if the underlying market itself is valuable — then naked short selling, far from being detrimental, may be valuable in facilitating the gains from short selling.

**COUNTERARGUMENT** In the previous section, we argued that naked short selling is nearly economically equivalent to permissible short selling and that the competition provided by naked short selling in the securities lending market may even make naked short selling beneficial. In this section, we consider a possible counterargument: naked short selling may increase price volatility — perhaps dramatically — relative to permissible short selling.

Before sketching this argument graphically, recall our argument (depicted in Figure 1) that short selling can generate price volatility when short sellers are incorrect about future demand for the security. We saw that if demand stays fixed at demand curve  $D^0$ , then short selling can generate price changes from  $P^0$  to  $P^{0+s}$  at the short sale, and then from  $P^{0+s}$  back to  $P^0$  when the short sale is unwound. In this manner, short sellers can bounce the price back and forth. Because they only lose transaction costs in the process, short sellers can — innocently or deliberately — induce heightened price volatility. And as we noted, this volatility is unrelated to changes in economic fundamentals at large or the security in isolation. We now show why this volatility will be worse with naked short selling.

When there is only permissible short selling, short sellers can cover their shorts when demanded by security lenders by buying back from the new owners who bought the expanded supply ( $Q^{0+s}-Q^0$ ). The demand curve, after all, is defined as the demand for the stock at those particular prices. A short seller that must cover thus need only buy back stock up the demand curve until the price returns from  $P^{0+s}$  back to  $P^0$  (where we are assuming that demand never shifted down). At this point, the new buyers are returned to their original positions and the short seller has lost transaction costs but nothing else. The price has “bounced” from  $P^0$  to  $P^{0+s}$  and then back to  $P^0$ .

Now consider Figure 3, which depicts what happens when only naked short selling occurs and the buyers with failures to receive initiate buy-ins. Initially, the naked short selling creates a price  $P^{0+s}$  from the “as-if” increase in supply from  $Q^0$  to  $Q^{0+s}$ . But none of the new buyers hold the stock because of failures to deliver caused by naked short selling.

If the new buyers demand delivery, the short seller has no

choice but to buy from existing owners. In order to deliver, the short seller must buy quantity ( $Q^{0+s}-Q^0$ ) in the market to obtain stock to deliver. Because the shares can only come from current owners that value the stock at price  $P^0$  and above, acquiring ( $Q^{0+s}-Q^0$ ) will drive the price up to  $P^*$ . This is not in equilibrium, however, because the new owners value the stock less than the market price and thus will sell the stock back to the old owners who sold to the short seller. This, in turn, drives the price back to  $P^0$ , leaving the stock in the same hands as before but precipitating a wealth transfer from the short seller to the new buyers. Price volatility is higher here because price bounces up to  $P^*$  from  $P^{0+s}$  before bouncing back to  $P^0$ . Under permissible short selling, the price only bounced from  $P^{0+s}$  to  $P^0$  when the short seller was forced to cover.

**ON BALANCE** Setting aside its illegality, we are left with the positive possibility that naked short selling is socially valuable in facilitating competition in the market for security lending — i.e., allowing new buyers to compete with current owners for the price of future delivery — and thus facilitating short selling that may be socially valuable but otherwise might not occur. But we also have the negative possibility that naked short selling may introduce excess volatility into stock prices. The comparative impact of naked short selling in this context can then only be settled empirically. But the theoretical possibility that naked short selling is beneficial on net does give us reasons to be skeptical of a priori assertions that naked short selling is detrimental.

## CONCLUSION

Despite a recent spate of lawsuits and media attention, the existing literature on naked short selling consists almost entirely of self-confessed advocacy pieces by lawyers and consultants involved in naked short selling cases or parties who are defendants in such lawsuits. We take a more balanced look at naked short selling. We have shown that, from an economic perspective, naked short selling is not fundamentally different from traditional short selling, is unlikely to have serious detrimental effects on capital markets, and might even present some benefits on balance.

Nevertheless, some naked short selling remains illegal. As with other matters of financial economics and policy, the debate on naked short selling would benefit from additional empirical research. **R**

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