



Stock Lending

The Next Frontier for Electronic Trading

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Efficient Frontiers LLC

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Introduction

The large and growing international marketplace to buy and sell stocks is the subject of constant study and commentary, involving market analysts, journalists, and scholars. But there is little general awareness of the much smaller, but important and growing, marketplace to borrow and lend stocks. That marketplace is beginning to see clear signs of computer-driven centralization, as new players enter the industry to bring borrowers and lenders together in a way that should significantly increase pricing transparency and reduce transaction costs.

How Does the Stock Lending Business Work?

Stock lending is the temporary transfer of stock to another investor. That investor can then sell or re-lend the borrowed stock during the loan period, which may be fixed or at the discretion of the lender (“at call,” which is typical for equities) or buyer (an “open loan”).

Why do financial institutions borrow stock? Traditionally, the most common reason was just to avoid a settlement failure – that is, not having the securities necessary to settle a trade at the time settlement is due. It was a plain vanilla back office operational function. More and more often now, however, borrowing stock is part of a trading strategy that involves short selling – selling a stock you don’t own in order to profit from its decline, or to hedge a another long position.

The rapid growth of hedge funds, which frequently rely on short-selling strategies, and so-called 130/30 funds (which go long 130% of expected overperformers, and 30% short in expected underperformers) in recent years has fuelled demand for loanable stock. Assets under 130/30 management have roughly doubled, to about 60 billion, since early 2007.¹

SEC rule-making on short-sales since spring of 2008 has been about as volatile as the market itself, but whereas the outright ban on shorting nearly 1,000 stocks imposed in October will almost certainly be lifted in due course, restrictions on so-called “naked shorting” - selling short

¹ Galper (November 2007). The figure cited in the paper for late 2007 is \$53 billion.

without having first borrowed the stock – are, if anything, likely to be tightened. Demand for stock lending services in 2009 and beyond is, therefore, likely to grow at a more robust pace as trading strategies involving short sales proliferate.

Trading strategies based on short-selling can be highly cost-sensitive. They may be attractive at one lending rate yet unattractive at another. Knowing, and being able to access, the universe of potential lenders and rates at any moment in time is therefore important. Yet this is nearly impossible in the current stock lending marketplace.

Lenders are typically pension plans, insurance companies, mutual funds, central banks, and brokers holding margined hedge fund long positions. US mutual funds loan out about 15% of their \$1.2 trillion in equity holdings at any given time, earning 1-2% annually on their loaned positions. Lenders have typically relied on their custodian banks to manage their lending activities. But given the large potential returns from aggressively marketing idle securities holdings for short-term loan, institutions are increasingly contracting their lending operations out to multiple specialist lending managers on a competitive basis. Over the past five years, the value of securities available for loan has risen at a compound annual rate of about 15-20%, to \$13.2 trillion,² about \$2.1 trillion (15%) of which is stock.³ The largest public pension funds, such as CalPERS, can earn upwards of \$150 million annually lending out securities.

The cost paid by a stock borrower is the lost interest on the collateral (normally cash) it must leave with the lender, plus or minus some premium or rebate depending on the supply of the security being borrowed. If that supply is tight, the borrower will typically pay the lender some additional percentage of the collateral (typically 0-5% annualized). If supply is ample, on the other hand, the lender will typically be obliged to rebate to the borrower some portion of the interest it earns on the collateral, normally the federal funds rate minus about 10 basis points (the “rebate rate”).

There is currently no central marketplace for stock borrows and loans. Borrowers typically depend on middlemen, such as prime brokers, to find the stock they need, and have few means at their disposal to ferret out more aggressive lending interest. Institutions with large portfolios of stock (“beneficial owners”), which they hold with custodian banks, similarly have no way to shop the universe of potential borrowers. One estimate suggests that custodians and prime brokers earn from about 3.5% to over 7% by borrowing from the asset holder and lending on to a hedge fund or other borrower.⁴

How is the Stock Lending Business Changing?

In the stock market, companies list their stock in order to reduce their cost of capital, while investors buy and sell shares in publicly listed companies in order to maximize returns on their

² O’Shea (2008)

³ Galper (March 21, 2007). Q4 2007 estimates from Spitalfields Advisors are virtually identical.

⁴ Galper (March 21, 2007)

savings. In the stock lending market, likewise, institutions looking to borrow stock want to minimize borrowing costs, and institutions holding stock want to maximize returns by lending it out when it would otherwise sit idle. Yet whereas there are globally accessible and transparent electronic stock trading platforms to buy and sell stock, where participants can access quotes from all other participants, there are, as yet, no such platforms to borrow and lend stock.

Borrowers complain that middleman pricing is volatile and opaque. Lender intermediaries bundle their offerings in costly ways; for example, obliging clients to borrow easy-to-borrow “general collateral” (GC) stock they could access more cheaply from other sources in order to get access to hard-to-borrow (HTB) stock they really do need. Lenders complain that they can’t lend out more than a small fraction of their available stock. Many hedge funds with huge idle inventory of stock loan out nothing, or virtually nothing, at all. The inability of borrowers and lenders to find and transact with each other directly represents a waste of scarce economic resources: higher costs of investment and lower returns on investment.

But the market is changing. New firms are offering services that are making it easier for borrowers and lenders to discover something closer to the “market price” of a stock loan at any given point in time, even if their ability to transact at that price may be strictly limited. Some firms are providing historical pricing data to help fund managers gauge trends in pricing. Some firms are offering large banks and brokers an electronic platform on which they can post bids to borrow stock and offers to lend stock. Yet borrowers can only transact with lenders with whom they have a formal bilateral credit relationship.

Nonetheless, single-bank and multi-bank electronic platforms are rapidly changing the way many players in the industry do business. ABN AMRO Mellon, for example, was in 2007 reporting nearly 70% of its equities lending business being conducted electronically, through its own system and one operated by a third-party provider, rather than over the phone.⁵ Stock exchanges themselves are moving into the business, as evidenced by NYSE Euronext’s majority purchase of the SecFinex platform. Other players involved in automating one or more aspects of securities lending – data provision, price quotation, negotiation, auction, execution, or post-trade processing - include Data Explorers, EquiLend, ICAP’s I-Sec, LocateStock, Quadriserv, and SunGard’s Loanet.

Only about 15% of securities lending business is expected to be done over some type of electronic platform in 2008.⁶ Over ¾ of securities lending market participants surveyed by Vodia Group wanted to see more electronic marketplaces emerging.⁷ This is not surprising: virtually every active market participant can identify some aspect of transactions automation that would cut their cost of doing business. Clearly, however, not all market participants benefit, on balance, from such developments. Many large banks and brokers have developed significant businesses intermediating transactions between borrowers and lenders who cannot find and transact with each other in the absence of a centralized marketplace. Prime brokers are estimated to generate

⁵ Maguire (2007)

⁶ O’Shea (2008)

⁷ Galper (November 2007)

about \$8 billion in annual revenue in lending to hedge funds.⁸ An electronic stock lending trading platform would ultimately allow beneficial owners to market their lendable stock directly – or at least more directly – to hedge funds and other borrowers. (We discuss some of the regulatory barriers to disintermediation further on.)

The Economic Benefits of a Electronic Stock Lending

In 1987, Nobel-prize-winning economist Robert Solow famously remarked that “computers are found everywhere except in the productivity data.” Whereas tremendous advances documented in US productivity in the 1990s were a relief to economists who had fretted over this apparent “Solow Paradox,” it remained difficult to quantify the contribution of computers and automation.

One of us, together with Ian Domowitz, set out to quantify the effect in one particular sector: securities trading.⁹ We sifted through market data and applied standard econometric techniques to measure the impact of trading automation on the cost of trading, and to measure the impact of declines in the cost of trading on trading volumes and the cost of capital to companies listing their stock.

We found that automation of trading in New York Stock Exchange (NYSE) and Nasdaq securities, through the use of nonintermediated electronic trading systems then known as “electronic communications networks” (ECNs), resulted in trading cost of reductions of 28-33%. We further found that for each 10% decline in trading costs, trading volumes rose 8%: an 80% elasticity. As this finding was based on trading in the late 1990s, prior to dramatic rise in stat-arb and high-frequency hedge funds, we believe this figure must be considerably higher today – a suspicion which would appear to be borne out by the dramatic rise in exchange trading volumes, almost invariably exceeding analyst expectations, following each successive wave of trading and clearing system reforms. Finally, we found that each 10% decline in trading costs resulted in a cost-of-capital savings to blue-chip listed companies of 1.5%: a 15% elasticity. This is a very significant effect, given the pace at which trading costs have been falling year on year over the past decade.

Of course, it is impossible to extrapolate directly from the stock trading market to the stock lending market, but there is every reason to believe that the broad effect would be similar. Automating the stock lending process – that is, bringing lenders and borrowers together on an electronic trading platform, and eliminating unnecessary intermediation by brokers and custodians – should lower the cost of borrowing. This will reduce the cost of portfolio management strategies, stimulating more stock trading and investment. It will further increase the returns that pension and mutual funds earn on their lending, raising returns for the fundholders. All of this contributes to further lowering the cost to companies of raising capital in the equity markets. (Note that spreads widened and trading volumes fell significantly in stocks subject to the SEC’s recent shorting ban.¹⁰ Both effects tend to raise the cost of equity capital.)

⁸ Galper (March 21, 2007)

⁹ Domowitz and Steil (1999, 2002).

¹⁰ Mackintosh (2008).

The Challenges Ahead

What are the challenges in consolidating an opaque, minimally automated, and fragmented securities lending market into something that resembles a modern electronic exchange, where all borrowers and lenders can find and transact with each other without costly and unnecessary intermediation?

There are powerful economic forces of convergence at play in terms of the way in which securitized financial products of all types are traded. Yet we still observe big differences in market structure across asset classes. Equities trade similarly to futures, for example, but differently from options. There are three main factors that account for such differences in the way different asset classes trade:

- The degree of standardizability of the products
- Regulation
- History and path dependence

Standardizability

Some products are highly standardized, like stocks. There is only one IBM common stock. Anyone who wants to buy or sell IBM stock wants to buy or sell exactly the same thing. It is therefore easy to put IBM stock on an electronic trading platform and to attract lots of buyers and sellers to it. No intermediaries are necessary, either to find the buyers and sellers or to commit to posting continuous buy and sell orders (a commitment which would require compensation from investors, and possibly the exchange).

IBM bonds, and options on IBM stock, on the other hand, are not nearly so standardized. IBM has issued many different bonds over the years, each of which has its own coupon and time to maturity. An electronic bond trading platform can offer an order book for each of those bonds, but buy and sell orders are likely to scatter across each of them, making it challenging to attract significant core liquidity in any one issue. This is why only a very limited group of bonds, such as “on the run” US Treasuries (the most recent issues), attract sufficient liquidity to be publicly traded without dealer intermediaries. Likewise, options on IBM stock cover a range of maturities and strike prices. This makes it necessary to have market makers continuously providing bids and offers across all these different IBM options.

Stock lending has limited standardizability. Of course, anyone who wants to borrow or lend IBM stock wants to borrow or lend precisely the same thing. However, lending terms in the marketplace vary in terms of duration and collateral type (even if the vast bulk of the lending business is done on an overnight basis, using cash collateral). Therefore an electronic stock lending platform faces the challenge of establishing standardized lending terms that a sufficiently broad group of borrowers and lenders can accept, or finding auction mechanisms that encourage the use of a particular set of terms.

Regulation

Futures trading and options trading take place under very different regulatory regimes in the United States. Futures exchanges are regulated by the Commodity Futures Trading Commission (CFTC); options exchanges by the SEC. Among the significant differences between the two regimes is in the area of clearing. Futures exchanges can own their own clearing houses. When they do, their products are not fungible across exchange: that is, you cannot move an open position in a contract from one clearing house to another. Exchange-traded options, however, are, as required by the SEC, cleared by a single clearing house utility – the Options Clearing Corporation (OCC). Many option contracts are fungible across exchange. The result is more direct competition among exchanges in the options space, and less incentive for product innovation (as it is more difficult to capture the benefits of such innovation).

Regulation of US equity trading is moving in a direction supportive of an exchange-like structure for lending. Temporary SEC restrictions on naked short selling in 19 major financial stocks in the summer of 2008 encouraged more systematic stock borrowing practices, making it easier to build the critical mass of borrowers and lenders necessary to establish good liquidity on a trading platform.

History and Path Dependence

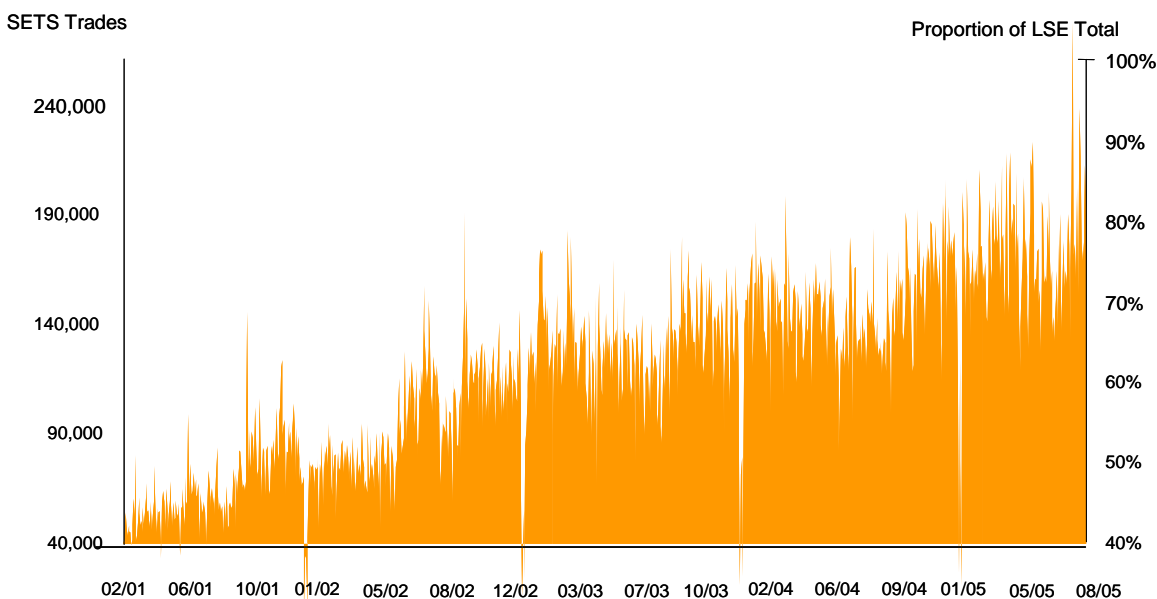
Markets begin developing at different times under different conditions. The state of technology, for example, was very different in the late 18th century, when the New York Stock Exchange was founded, and the early 1930s, when the US OTC stock market developed. The NYSE naturally evolved as a physically centralized floor-based auction system. The OTC market, on the other hand, emerged contemporaneously with the advent of long-distance telephony in the United States, allowing a decentralized, telephone-based marketplace to develop. The advance of computer networking technology in the 1960s facilitated its transformation into the screen-based Nasdaq dealer market in 1971. The electronic dealer market structure, more heavily intermediated than the NYSE continuous auction structure, made sense for the small-cap stocks which defined the OTC marketplace at the time. Many of these stocks, however, became large-cap stocks over time, eliminating the logic behind dealer intermediation of all Nasdaq trades. Today, of course, NYSE and Nasdaq market structures, based on electronic order books, are virtually identical. Their ownership and governance structures are as well. Yet each exchange took a very different (though similarly painful) route to reach this convergence.

The stock lending business evolved around the critical roles of two classes of intermediaries: the custodian banks that held stock for the beneficial owners, and the brokers who sought stock out on behalf of their institutional clients who needed to borrow it. These transactions rose with the growth of hedge funds and, to a lesser degree, 130/30 funds, which greatly expanded the practice of short selling. In the absence of significant short selling activity, the cost of trying to centralize and automate the stock lending process exceeds the benefits. Today, however, the cost-benefit balance is shifting rapidly in favor of automation.

The Key to Efficient Electronic Stock Lending

The single most important component, and the greatest challenge, in developing a maximally efficient trading platform for stock lending is the incorporation of central counterparty (CCP) services, as we see in the exchange-traded futures, options, and equities businesses. A CCP is vital for trading efficiency. A CCP eliminates the web of bilateral credit arrangements that currently defines, and strictly limits, who can trade with whom, and replaces it with a single intermediary that stands in the middle of all transactions. This eliminates bilateral credit risk. It reduces costs by netting a day's transactions in each security for each participant, cutting the number of transactions that have to be settled. Finally, a CCP makes the marketplace fully anonymous, as no market participant needs to reveal its identity, either before or after the transaction. This encourages participation from borrowers who would otherwise be concerned that counterparty knowledge of their identity can be used to move market prices against them – as it was routinely in European equity markets before the exchanges adopted CCPs earlier this decade. Figure 1 below shows how the London Stock Exchange's electronic order book (SETS) trading volume, which had been stuck for years at about 40% of total LSE volume, soared after the launch of CCP services in 2001.

Figure 1
LSE Trading Post-CCP



Source: London Clearing House

But to make a CCP-based marketplace work, all participants in that marketplace must be willing to use the service. As in the foreign exchange market, however, which we discuss below, banks and brokers that stand to lose revenues from doing business the traditional way – marking up

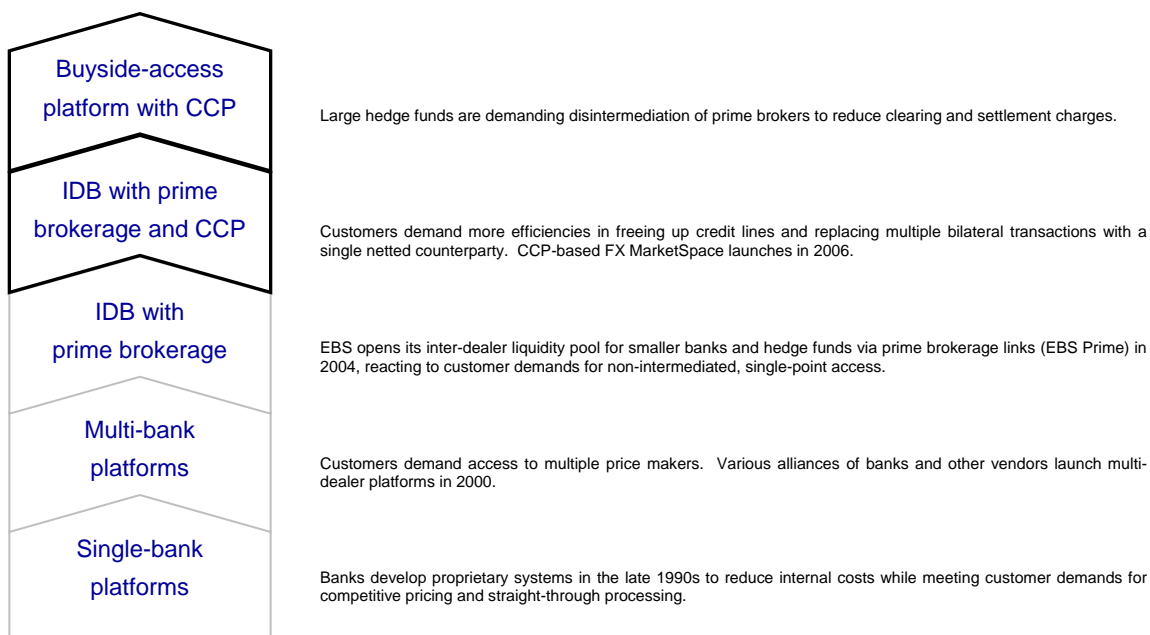
stock loans and managing collateral - will be reluctant to accommodate the emergence of CCPs, and will only do so once pressure from client borrowers and lenders becomes intense. Middleman margins will undoubtedly shrink, as they did in the equity markets – particularly Nasdaq and London after full electrification and dealer disintermediation a decade ago. Volumes will rise in tandem. Yet the new business model required to benefit from this rise virtually ensures a shake-up in the names that will dominate securities lending in a stock lending market based on CCPs.

How will the behavior of major borrowers change? Hedge funds in particular can be expected to demand a very different sort of service from their prime brokers. Instead of expecting the broker to provide or find the stock needed, hedge funds will shop for themselves on electronic lending platforms, asking their brokers merely to provide credit intermediation with the platform and its CCP. Larger hedge funds will cut out their brokers entirely, accessing the platform and posting margin with the CCP directly (which in cases may require their using a broker-dealer subsidiary). Many are also likely to add or significantly expand stock lending activities once they have access to a centralized marketplace with transparent pricing and pricing data.

The Case of the Foreign Exchange Market

The evolution of foreign exchange (FX) trading provides the most useful guide to the challenges of transforming the securities lending business into a transparent and efficient one, with no more intermediation from brokers and custodians than borrowers and lenders actually need. This evolution is summarized in figure 2 below, with the top two sections of the lefthand column indicating where the process is currently stalling.

Figure 2
Evolution of Electronic FX Trading



The FX market began the transformation from a fragmented, telephone-based market into a more centralized electronic one in the late 1990s. Individual banks launched proprietary trading systems for their institutional clients to request quotations and execute trades, lowering their own cost of servicing clients while reacting to client demands for greater communications and transactions efficiencies.

But clients pushed much further. If they could receive and execute against electronic quotations from one bank, why not from many banks? Third-party providers then moved in to offer multi-dealer trading platforms, despite resistance from some of the biggest FX banks.

Yet institutions could still only trade with banks with which they had a formal bilateral credit line, so many quotes remained inaccessible. This led to demands from hedge funds and smaller banks for more direct electronic access, through prime brokers, to quotes from a wider range of dealers. Multi-dealer platform EBS became the first to offer such sponsored access, in 2004. FX market turnover soared by 40% from 2005 to 2007, to almost \$100 trillion.

This stimulated further demands from hedge funds, which increased their market share of total FX trading from 11% in 2006 to 20% in 2007, this time for lower trading costs through the use of daily transaction netting, prior to settlement of trades, as well as greater anonymity. This required trading platforms with CCPs, like the one launched by Reuters and the Chicago Mercantile Exchange, called FX MarketSpace, in 2006. This is the point at which bank resistance slowed down the evolution of the FX marketplace toward the structure we see in futures and equities. CLS, the bank-controlled settlement platform for FX transactions, refused to accept pre-netted trades, as this reduced the number of transactions processed by CLS and, in consequence, its settlement income. FX market developments since then have focused on finding a compromise with CLS, or a way around it.

Still, the hedge funds push on for even greater efficiencies, by looking for ways to cut the cost of, and the necessary scope for, prime brokerage. In particular, the largest and most actively trading funds are looking to join clearing houses directly, as a means of further slicing post-trade fees.

Challenges of Building a Successful Stock Lending Platform

To paraphrase Tolstoy, all efficient markets resemble one another, but each inefficient market is inefficient in its own way.

The US stock lending market is a case in point. It is a market full of anomalies, some of which can appear downright bizarre to outsiders. These anomalies pose some significant challenges to creating a transparent and efficient electronic stock lending marketplace.

As an example, why can't the market discipline "naked shorting" on its own? Why should the SEC have to oblige anyone to borrow (or even "pre-borrow") stock before shorting it? One might think that market participants would be deterred from naked shorting by penalties for failure to deliver stock on settlement date. Many national markets charge hefty fines for failed trades, or make them a technical impossibility. Yet the US settlement operator, DTCC, does not penalize failed trades. It credits the buyer for the stock even when the stock is never delivered by the seller, who has no incentive to pay interest on borrowed stock if there is no cost for settlement failure.

Why is there such a thing as "hard-to-borrow" stock? In a normal, efficient marketplace, supply reacts to demand, and so the product is either "more expensive" or "less expensive" – not "hard to buy." HTB stock is simply stock which is underpriced (to borrow) relative to "easy-to-borrow" GC stock. This fact is easy to see in that agent lender-banks routinely funnel HTB stock to agent broker-borrowers as a reward for carrying a high ratio of GC-to-HTB borrowing balances: a practice known as *ratio lending*. This sort of bundling keeps the true equilibrium lending price of different stocks opaque, favoring intermediaries who have better access to supply information.

Standardizability of product is a critical feature of an efficient exchange. A stock loan is not an inherently difficult product to standardize, but the challenges of adapting current market practices make it so. Standardizing a stock loan should naturally involve standardizing the lending terms – for example, excluding the possibility of lender recall. But regulation can make this difficult: for example, U.S. ERISA¹¹ rules bar a beneficial owner from lending shares that cannot be recalled the next day.

So What's Next?

Given the idiosyncratic features of the stock lending market, what will a viable stock loan trading platform look like? A few distinctive features are likely.

First, we are not dealing with a product for which frequent price changes are necessary. The price for borrowing a stock, the fed funds rate +/- x basis points, will not generally change minute to minute. Trading will likely therefore take place around a series of "call auctions" before, during, and after the trading day. In a call auction, trading takes place at a specific, pre-determined point in time, usually at a single price calculated to maximize the volume of stock that changes hands. Most borrowers and lenders transacting between auctions will likely be satisfied to transact at the last auction price.

Second, if lending terms cannot be strictly standardized (which would be optimal from the perspective of the platform operator), financial carrots and/or sticks will need to be used to encourage borrowers and lenders to approximate standardized terms: for example, not recalling stock, or not changing the rebate rate, vis-à-vis the fed funds rate, while the stock is out on loan.

¹¹ ERISA = Employee Retirement Income Security Act.

Third, borrowing and lending of stock is governed by a set of counterparty restrictions that typically make it difficult for asset owners to deal directly with end borrowers. For example, retirement plan sponsors can, because of ERISA rules, only lend to registered banks and brokers. Disintermediation has its limits, therefore, at least in the current regulatory environment. Some OTC counterparty conventions will in consequence have to be preserved in the clearing process, which will not approach the level of efficiency of the futures markets any time soon. The challenges are similar to those currently facing both banks and exchanges in the credit default derivatives market, where all parties agree on the need for centralized counterparty risk management, but there is no consensus on the degree to which business models that have developed around the current OTC architecture need to be conserved.

In short, the stock lending market is ripe for change – change that will inevitably lead to more computer-driven centralization of activity. This will never be a market that generates the sort of colorful, frenzied activity beloved of CNBC. But given the potential for this change to improve price discovery, systematically increase investment returns, and promote more effective risk management, it is change more than worthy of the attention of institutional investors and regulators.

References

Domowitz, Ian, and Benn Steil, “Automation, Trading Costs, and the Structure of the Securities Trading Industry,” *Brookings-Wharton Papers on Financial Services* (1999).

Domowitz, Ian, and Benn Steil, “Innovation in Equity Trading Systems: the Impact on Trading Costs and the Cost of Equity Capital,” in Steil, Benn, David G. Victor, and Richard R. Nelson (eds.), *Technological Innovation and Economic Performance*, Princeton: Princeton University Press (2002).

Galper, Josh, “Securities Lending and Asset Holders: Tracking US Equity Inventory Supply,” Vodia Group LLC (March 21, 2007).

Galper, Josh, “The Mountain Moves: Electronic Bid/Offer Markets in Securities Lending,” Vodia Group LLC (November 2007).

Mackintosh, James, “Short Shrift,” *Financial Times* (October 6, 2008:10).

Maguire, Frances, “Breaking the Mould”, *The Banker* (July 1, 2007).

O’Shea, Virginie, “Securities lending in the limelight,” *Securities Lending Market Guide 2008*, Investor Services Journal (2008).