

Greater competition, fueled by technology, will lessen  
the need for regulation of exchanges

# Electronic Exchanges Are Inevitable and Beneficial

BY CRAIG PIRRONG

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INANCIAL MARKETS IN THE UNITED STATES AND around the world are being transformed, fundamentally and rapidly, as computerized trading of stocks, futures, and options replaces traditional open outcry trading,

where buyers and sellers shout the prices at which they are willing to transact. (See the accompanying “trading primer” for more about trading in stocks and derivatives.)

Whereas member ownership, nonprofit organization, and political governance are well-suited to open outcry exchanges, they are ill-suited to electronic trading. Moreover, the financial limits inherent in nonprofit form and member ownership constrain exchanges’ ability to invest in the technology they need to remain viable.

Technological change is therefore driving nearly every exchange in the world to consider a revolution in its structure. It is hard to pick up a newspaper without seeing a story about one exchange or another discussing its plans to change from a nonprofit, member-owned organization to a for-profit firm with publicly traded stock.

Some regulators have expressed concern that for-profit exchanges will require greater scrutiny than nonprofit exchanges because they will respond to the interests of their shareholders rather than to the interests of the trading public. In this respect, because for-profit exchanges are substantively no different from nonprofit ones, there is no clearcut need for more intense regulatory oversight of for-profit exchanges. The organizational implications of technological change for regulation are less important than the

competitive implications. If, as I argue here, computerized markets are more competitive than traditional open outcry markets, the need for regulation of securities and derivatives markets will diminish.

## WHAT IS GOING ON? AND WHY?

FINANCIAL EXCHANGES—STOCK, FUTURES, AND OPTIONS markets—have been organized and run like clubs for hundreds of years. Just as only members can play the course at a golf club, only members can trade on the floor of the New York Stock Exchange (NYSE), the Chicago Board of Trade (CBT), and the Chicago Board Options Exchange (CBOE). You cannot buy shares of stock in the local golf club, and you cannot buy stock in any of those exchanges either—not yet, at least. An aspiring floor trader must apply for membership, be accepted by the exchange, and buy a “seat” that confers trading privileges. As with most clubs, the traditional financial exchange is run as a nonprofit organization that cannot distribute profits or dividends to its membership.

In the past few years, however, a few stock and derivatives

exchanges have announced plans to jettison member ownership and become for-profit public companies. In the past few months, the trickle has turned into a tsunami. Almost every major financial exchange in the world—including such venerable institutions as NYSE, the London Stock Exchange, and CBT—is actively considering a change from nonprofit, “mutual” status to for-profit form. The chairman of NYSE views such a change as inevitable, and several exchanges (including NYSE) are contemplating the sale of stock to the public. The directors of one major U.S. exchange—the Chicago Mercantile Exchange—have stopped talking about conversion and have voted to make the exchange a for-profit company with publicly traded stock.

Why the sudden change? Why now? The answer lies in one word: technology. The rapid shift toward electronic trading of stocks, futures, and options will change not only how those products are bought and sold but also the organization, governance, and finances of the exchanges on which they are traded. The old forms of organization were suited to old ways of trading. New trading technologies require new forms of organization and governance.

The fundamental reason for the transformation is that electronic trading of stocks, futures, and options will lead to “disintermediation.” With electronic trading, many of the middlemen essential to the smooth operation of trading on an exchange floor are superfluous and others will no longer play the central roles that they now play in traditional markets. Historically, intermediaries have owned exchanges to protect their valuable, and quite specialized, human capital. The elimination of many intermediaries and the reduction in the importance of others undercuts the need for ownership of exchanges by intermediaries.

Unbound by the interests of intermediaries, an electronic exchange can adopt for-profit ownership and tap equity markets to raise the substantial funds needed to build a state-of-the-art trading system. As a corporation, an electronic exchange also can adopt more efficient decision-making and governance procedures. The transformation of exchanges is therefore a case of form following function.

Financial regulators have expressed concern that investor-owned exchanges face serious conflicts of interest that will impair their ability to police their markets and see to it that institutional and retail customers are not cheated. Those fears are probably overblown, however, because for-profit and nonprofit exchanges differ in degree rather than in kind. Even though traditional exchanges are nonprofit organizations, their owner-members are keenly interested in making money through the trading they do on the exchange. Conflicts of interest between the owners of exchanges (whether they are members of a nonprofit or shareholders in a for-profit) are most likely to arise when exchanges face imperfect competition. Therefore, the key

issue is how the coming dominance of electronic trading will affect competition. On that score, there is room for optimism. Competition in cybertrading may well be more intense than in traditional floor trading, which would increase the exchanges’ incentives to self-regulate—and reduce the need for government oversight.

### TRADITIONAL EXCHANGE TRADING AND ORGANIZATION

SINCE THE LONG-AGO BIRTHS OF EXCHANGES (MORE THAN two centuries ago in the case of NYSE, 150 years ago in the case of CBT), trading of stocks, futures, and options has been done face to face in a central location, called the exchange floor. There, trades are executed through an open outcry auction.

Just as the trading process has remained relatively unchanged, so has the organization of exchanges, which is well-suited to open outcry trading.

The open outcry process involves many specialized intermediaries, such as brokerage firms, floor brokers, and liquidity suppliers. Brokerage firms (sometimes called “wire houses” or “commission merchants”) receive customers’ orders and direct them to an exchange floor. There, floor brokers (who are usually independent operators) execute the orders with other brokers or with individuals and firms that place their own capital at risk to absorb the buy-sell imbalances that are inevitable in the ebb and flow of trading activity. These floor traders—known as “specialists” and “the floor crowd” on stock exchanges and “locals” on futures exchanges—provide the liquidity that is essential to the efficient operation of exchanges. Liquidity providers ensure that there is always someone who will take the other side of a buy or sell order from an institutional or retail trader located away from the floor.

The process I have just described has remained virtually the same for well over a century. To be sure, innovations in communication and information technology have affected floor trading. In particular, changes in communications technology from the telegraph to the telephone to the computer have changed how orders are routed to the exchange floor. But the actual process of executing an order through the open outcry auction has changed little. A CBT or NYSE member from 1899 would easily adapt to the exchange floor of 1999.

Just as the trading process has remained relatively unchanged, so has the organization of exchanges, which is well-suited to open outcry trading. When exchanges were formed in the eighteenth and nineteenth centuries, they were organized as not-for-profit firms with member-own-

ers. An exchange's members were the intermediaries—the brokers and liquidity suppliers—who traded on it. Only member-owners could trade on the floor. The same is true today. Exchanges are nonprofit “mutuals” where trading privileges and ownership are inseparable.

Member ownership of nonprofit exchanges protects the valuable human capital of exchange members from opportunistic expropriation. Brokerage firms, floor brokers, and open outcry liquidity suppliers have—or acquire—skills, traits, and knowledge that are valuable in their business but which may have little applicability in other businesses. An important skill of a floor trader, for example, is the ability to “read” the signals in the order flow. Having a good reputation among other traders on the floor is also important. A person who makes many errors, who tries to back away from bids or offers, or who tries to undo losing trades has a hard time finding someone to trade with. It takes time to build a reputation for being a good, dependable trader. Moreover, floor traders have some important information advantages over those who trade off the floor, especially in futures markets. Only those on the floor know the prevailing market price at any moment. That valuable information generates profits for floor traders.

Specialized skills and information advantages generate profits for intermediaries that are much greater than what they could earn in other professions. The price of an exchange membership capitalizes future profit streams.

capital by threatening to set up shop elsewhere unless he allowed them to use the assets for a song.

Opportunism also could arise if traders did not control the making and enforcement of exchange rules. A non-trader in charge of making the rules could extort wealth from floor traders by threatening to impose rules that reduced their profits unless they paid him enough to persuade him to do otherwise.

An individual floor trader cannot readily escape opportunistic behavior by moving to another exchange because liquidity considerations and economies of scope tend to concentrate trading activity on a few exchanges.

Moreover, it is costly to move to another exchange. An important part of a floor trader's human capital consists of his reputation among his peers and his knowledge of the idiosyncrasies of a particular market and its participants. Such capital is quite specific to a particular exchange and would be lost by moving to another exchange. Similarly, it would be harder for the owner of a trading floor to find a new group of traders than it would be for, say, major league baseball to find a new group of umpires.

The potential for opportunism therefore makes it efficient for intermediaries to own an open outcry exchange's physical assets and to control its rulemaking and governance.

Further, it is desirable for exchanges to be organized as nonprofit firms when intermediaries are heterogeneous. (Heterogeneity implies that increases in exchange fees

reduce the profits of some intermediaries more than the profits of others.) If an exchange distributes profits pro rata among members, by altering its fees it can redistribute wealth from those members whose profits are very sensitive to fees to those members whose profits are less sensitive to fees. That possibility creates wasteful incentives, namely, an incentive to set fees that

inefficiently distort the production of member services and an incentive for some member-intermediaries to expend resources to induce the exchange to alter its fee schedule. Such incentives are not present in a nonprofit exchange because it is precluded from distributing profits to the members.

Heterogeneity also influences exchange governance. Exchange governance is often criticized as slow and political. But when exchange members are heterogeneous, governance must be political because it performs the essentially political function of balancing conflicting interests. Moreover, checks and balances are required to protect vulnerable groups of intermediaries from expropriation by others. Checks and balances slow the pace of decision-making, but they are justified to the extent that they impede wasteful behavior.

In sum, the organization of exchanges is an efficient adaptation to the nature of open outcry trading. That is not to say that no costs attach to member ownership, non-

## Specialized skills and information advantages generate profits for intermediaries that are much greater than what they could earn in other professions.

Memberships in futures and options exchanges cost hundreds of thousands of dollars; NYSE memberships cost millions of dollars. These “seat prices” actually understate the profits that most members earn because they reflect the profits of the *marginal* (least efficient) member.

Exchange members require specialized trading facilities to earn their profits. Exchange floors are specialized—and quite useless for anything but open outcry trading. For instance, the new CBT trading floor—as large as a Boeing 747 hangar—is dotted with octagonal trading “pits” sunk into the floor and wired with 27,000 miles of telephone, computer, and power lines. Such a facility does not lend itself to any use other than open outcry trading.

The coexistence of specialized human and physical capital creates the potential for opportunism. If an outsider owned an exchange's physical assets, he could deny traders access to it unless they promised to pay him a substantial fraction of the value of their capital. Or traders could attempt to expropriate the value of the asset owner's

profit form, and political governance. In particular, they preclude an exchange from raising capital through the sale of stock. The persistence of member ownership through time and around the world suggests, however, that the benefits of the traditional structure of exchanges have outweighed its costs. That will no longer be the case in the electronic era.

### THE ELECTRONIC TRADING REVOLUTION

AFTER CONSIDERABLE RESISTANCE AND DENIAL BY OPEN outcry traditionalists, it is now almost universally recognized that floor trading is doomed and soon will be supplanted by electronic trading. Indeed, the transition already has swept European markets. Futures exchanges in London and Paris have closed their floors and moved trading to machines. The London International Financial Futures and Options Exchange (LIFFE) went electronic after the near-death experience occasioned by the loss of its biggest contract (a futures contract on German government bonds) to Eurex, the upstart computerized German futures exchange. U.S. exchanges soon will follow suit.

With computerized trading there is no exchange floor. Instead, traders sitting in their offices enter buy and sell orders at terminals that are linked to a central exchange computer. The exchange computer matches orders according to algorithms based on an order's price and time priority. Although present computerized trading networks are proprietary, it is likely that computerized trading eventually will be done on the Internet.

Electronic trading upsets the balance between technology and organization. For one thing, electronic trading causes "disintermediation"; some kinds of intermediaries—notably floor brokers—are unnecessary in cybertrading. And electronic trading changes competitive conditions for other kinds of intermediaries.

In particular, electronic trading transforms the economics of liquidity supply. Open outcry exchanges rely on a specialized class of liquidity suppliers who are effectively tied to a particular exchange. But anyone with a computer and cash can supply liquidity in an electronic market, as illustrated by the phenomenon of day trading in over-the-counter (OTC) stocks listed on the National Association of Securities Dealers Automated Quotations (NASDAQ) system. Competition from day traders, facilitated by NASDAQ rule changes, has eroded the profit margins of traditional liquidity suppliers, the market making firms. We will see similar results when day traders enter the market for listed stocks, futures, and options when they are traded electronically.

Day traders and other nontraditional liquidity suppliers (e.g., international market-making firms) are not tied to a particular exchange. They can switch markets at the click of a mouse. That reduces their vulnerability to opportunistic exploitation by any particular exchange.

Moreover, electronic trading eliminates the informational advantage of floor traders. Everyone sees the market price when it is on a screen, further dissipating the profits of traditional liquidity suppliers.

With fewer types of intermediaries and the uncoupling of intermediaries from exchanges, there is less need for member-owned exchanges. Day traders and professional trading firms do not need to own the exchanges they trade on, and floor brokers will not be around to own anything. A smaller, less heterogeneous set of intermediaries also lessens the need for nonprofit exchanges with elaborate, political governance. Thus, the organizational safeguards essential to the efficient operation of an open outcry mar-

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Member ownership severely constrains the ability of exchanges to finance the investments required to remain technologically competitive.

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ket become superfluous with computer trading.

At the same time, the cost of building state-of-the-art trading systems puts nonprofit, member-owned exchanges at a severe disadvantage because of their inability to raise capital through equity markets. The resulting financial strains have become increasingly apparent in recent years. Mergers have been driven by the inability of exchanges that needed technological upgrading to finance them internally.

The financially strapped American Stock Exchange was driven into the arms of the better-capitalized NASDAQ. The proposed merger between CBOE and the Pacific Stock Exchange, driven by the cost of acquiring new technology, was not completed because of the prospect of a lengthy review by the Antitrust Division of the Department of Justice. Instead, CBOE tried to raise capital for technology investment by selling new memberships, only to have that proposal unceremoniously rejected by the exchange's existing members. These episodes show that the tight funding constraints inherent in member ownership now bind more tightly.

In sum, member ownership offers fewer benefits to the electronic exchange than to the open outcry market, and member ownership severely constrains the ability of exchanges to finance the investments required to remain technologically competitive. Therefore, simultaneous movement toward electronic trading and the elimination of traditional exchange organization makes eminently good sense. A for-profit exchange, financed in part by equity sales to outsiders, economizes on transactions costs and is able to finance expensive new trading systems. Technological change is driving organizational change.

Even after exchanges go public it is unlikely that their

owners and customers will be as distinct as, say, the Kellogg's shareholders and the consumers of cornflakes. The remaining intermediaries (large brokerage houses), important customers (commercial hedgers, mutual fund firms), and large trading houses will have too much of a stake in exchanges' rules, policies, and pricing to be mere users of exchanges' services; they will want to have an ownership stake to protect their interests. Thus, I expect that when the dust settles, stock in U.S. exchanges will be publicly traded, but large blocks will end up in the hands of major market users.

Events in Europe bear me out. The Swedish exchange, OM, is publicly traded, but there are concentrated ownership blocks. Major German banks (the primary intermediaries and market users) own 81 percent of the German stock and futures markets. And the abortive plan to sell stock in Britain's International Petroleum Exchange would have placed 70 percent of the shares with major market participants.

### IMPLICATIONS FOR THE REGULATION OF FINANCIAL MARKETS

U.S. SECURITIES, OPTIONS, AND FUTURES EXCHANGES ARE

extensively regulated. Moreover, they are obliged to regulate themselves. Their obligations include policing their markets for fraud and manipulation.

State and federal regulators have expressed concern that for-profit exchanges will shirk their self-regulatory responsibilities. Arthur Levitt, chairman of the Securities and Exchange Commission (SEC) has made it clear that his agency will be watching the exchanges closely. Levitt stated that "any proposed structure" must be "consistent with the protection of investors and the maintenance of a fair and orderly market." Levitt also has indicated that he would object if NYSE attempted to operate directly its self-regulatory arm if the exchange goes public.

Regulators' concerns are rooted in the belief that the interests of the shareholders in a for-profit exchange conflict with the interests of the trading public, and that the interests of the exchange's shareholders will win out. For instance, SEC commissioner Laura Unger worries that self-regulation may lose out to business priorities in a "fight for resources" in a profit-maximizing exchange. The deputy counsel for the Pennsylvania Securities Commission stated: "We have to worry about a vacuum on the regulatory side with all the focus on the survival side." One worry is that for-

## A Trading Primer

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**S**TOCKS ARE TRADED IN SEVERAL ways in U.S. markets. Some companies choose to list their stocks for trading on traditional exchanges. The New York Stock Exchange (NYSE) is the most important listing exchange, but listed stocks are also traded on the American Stock Exchange (AMEX) and regional exchanges in Chicago, Philadelphia, Boston, San Francisco, and Los Angeles. Regional exchanges trade stocks that are listed on other markets as well as their own listings. Stocks that are not listed on an exchange (including many technology stocks, such as Microsoft) are traded in the over-the-counter (OTC) market.

### TRADING IN STOCKS

**Floor Trading** Trading in listed stocks takes place primarily on an exchange floor. A customer who wants to buy 100 shares of IBM stock "at the market" submits his order to a brokerage firm. The brokerage sends the order to a floor broker located at the IBM trading "post." The broker is an agent of the customer. The floor broker announces that he has

an order to buy 100 shares and solicits offers from others at the post. The broker may deal with another broker who has a customer order.

Alternatively, the broker may buy the shares from the "specialist." The specialist is a firm that buys and sells stock on its own capital. The specialist always quotes prices at which he is willing to buy (the bid) and sell (the offer). The specialist also handles so-called "limit orders" in which customers specify their willingness to buy or sell at specific prices. For some stocks there are independent floor traders who quote bid and offer prices.

The specialist, limit-order customers, and independent traders all compete to supply liquidity to the market by standing ready to buy or sell at prices that they quote. The floor broker trades with whoever offers the best price, be it another broker, the specialist, a limit order submitter, or an independent trader.

**Over-the-Counter Trading** Trades in OTC stocks are not executed in a physical marketplace. The most heavily traded OTC stocks are part of the National

Association of Securities Dealers Automatic Quotations System (NASDAQ). NASDAQ is not a market per se; it is a computer network that disseminates bids and offers to buy stocks.

In the "old" NASDAQ (i.e., before 1997), only dealers (also called market makers) could post quotes. (Dealers are firms that supply liquidity by posting bids and offers to buy and sell stock with their own capital.) Dealers were under no obligation to display customer limit orders on the system. Thus, a customer who wanted to buy 100 shares of Microsoft stock would contact his broker. The broker would consult NASDAQ to determine which dealer was offering the stock at the lowest price. The broker would then telephone the dealer with the lowest offer and arrange to buy the stock.

A series of controversies surrounding NASDAQ led the Securities and Exchange Commission (SEC) to adopt new rules for NASDAQ in 1997. One of the most important new rules requires dealers to display customer limit order bids and offers on NASDAQ.

**Electronic Trading** Electronic communication networks (ECNs) have exploited that rule. A customer can submit limit orders to buy or sell stock to an ECN. As

profit exchanges will try to increase their profits by slashing enforcement expenditures.

But the tension between regulation and profit is not unique to for-profit exchanges. The interests of the members of traditional nonprofit exchanges are not always perfectly aligned with the interests of institutional and retail investors. After all, exchange members are in business to make a profit, not to do good works. The nonprofit form precludes members from making money in the form of dividends paid by the exchange, but they make money in other ways. Moreover, the members of a nonprofit exchange might desire a reduction in the exchange's enforcement expenditures because that would allow a reduction in the fees they pay the exchange. Indeed, it is likely that members of a nonprofit exchange are more aware of regulatory costs and fees than outside owners of a for-profit exchange would be. Therefore, it is by no means clear that for-profit exchanges would spend less on self-regulation than nonprofit exchanges.

Moreover, nonprofit exchanges can—and do—adopt rules that increase their members' profits, frequently at their customers' expense. Nonprofit exchanges have enforced cartels among members. They have set large bid-

ask spreads for the benefit of liquidity suppliers. And they restrict competition by limiting the number of members. Nonprofit exchanges are *not* charitable institutions.

Indeed, securities and commodities regulations in the United States grew out of a belief that exchange members could not be relied upon exclusively to police the markets. Exchanges have been criticized at times for purportedly insufficient efforts to police fraud and manipulation in their markets. Any difference between for-profit and nonprofit exchanges is therefore one of degree, not of kind. It is difficult to say which type of exchange will regulate itself more effectively.

If exchanges fall short of perfection in self-regulation, it is in large part because they face insufficient competition. Thus, it can be argued that electronic exchanges will face more competition and will therefore regulate themselves more effectively.

Trading in a particular stock or financial contract (such as a futures contract) tends to concentrate on a single exchange because of liquidity considerations. And open outcry exchanges possess several advantages that make it difficult for new open outcry exchanges to enter the market. For example, incumbent exchanges have an experi-

the name suggests, those orders are communicated electronically to a central computer. If the customer submits a buy order, for instance, the ECN computer first determines whether there are customer sell orders in the system at prices equal to or lower than the price the buyer specifies. If there are, the ECN matches these orders. If not, the ECN routes the order to NASDAQ.

Some ECNs execute as much as 60 percent of their orders on NASDAQ. The proliferation of ECNs (such as Instinet, Island, and Archipelago) has made it easier for customers to enter limit orders (and therefore supply liquidity) in competition with traditional OTC dealers.

"Day traders" are individuals who supply liquidity (by submitting limit orders) in competition with dealers. Day traders typically use ECNs. That competition has caused dealer profits to fall and the number of dealers in most OTC stocks has declined as a result.

## TRADING IN FUTURES AND OPTIONS

THE PAYOFF ON A FUTURES CONTRACT depends on the price of the underlying asset. In the case of German bond futures, for example, the payoff depends on the price of German government bonds

(bunds) at the time the contract expires. Futures exchanges design contracts and list them for trade. Their members earn profits by supplying brokerage and liquidity to customers who desire to trade the contract. Although many exchanges may launch similar contracts, trading typically gravitates to a single exchange.

**Floor Trading** Trading in futures and options markets in the United States takes place primarily on exchange floors through open outcry auctions. Customers submit orders to buy and sell to brokerage firms. Those orders are then routed to brokers on the exchange floor, where each futures contract is traded in its own "pit."

If a customer wants to sell a corn futures contract, a floor broker in the corn pit shouts out, asking for bids. Other traders on the floor shout out their bids. The broker then executes a trade with the highest bidder. Some of the other traders are also brokers trading for customers, but many are so-called "locals" who trade on their own account. Locals supply liquidity by selling when there is an excess of buyers and buying when there is an excess of sellers.

Some pits (such as the Treasury bond futures contract pit at the Chicago Board

of Trade) have hundreds of brokers and locals; others have a mere handful. Trading activity in the largest pits is loud and frenzied. Despite the seeming chaos, open outcry has proved a very efficient means of trading futures and options.

**Electronic Trading** Several U.S. futures exchanges trade by computer after regular trading hours. Customers submit orders electronically to a central computer that matches buy and sell orders based on algorithms that assign price and time priority to each order. Orders are matched on the basis of price, and if there is a tie along the price dimension, orders are then matched by time of submission.

Several European exchanges, including Germany's Deutsche Borse and Sweden's OM are completely computerized and have no floor trading. The London International Financial Futures and Options Exchange (LIFFE) went electronic after it lost its biggest contract (a futures contract on German bunds) to Eurex, an upstart computerized German futures exchange.

When trading in bund futures shifted from LIFFE to Eurex, the members of LIFFE could no longer earn profits from supplying liquidity and brokerage. ■

enced cadre of expert liquidity suppliers that competitors cannot readily duplicate. Moreover, an open outcry exchange must incur significant, unrecoverable costs to compete with an incumbent (e.g., floor space, a specialized pit, and marketing). Thus, there have been few instances of a new exchange supplanting an incumbent when both trade by open outcry.

The advent of electronic trading should foster competition because entry will be easier and cheaper. With cyber-

approve the terms and conditions of every new futures contract before it is eligible for trade. That requirement raises the costs of entry and impedes competition. It also creates considerable legal uncertainty: determining just what is a futures contract that must be traded on an exchange and what is a financial contract that can be traded over the counter is a task of Talmudic complexity. The consequent legal costs and uncertainty can impede innovation.

It would be better to eliminate the contract market requirement. That would increase the competition exchanges face, thereby reducing the need for micromanagement of exchange rules. Unfortunately, exchanges understandably resist proposals to relax the contract market rules because such proposals are seldom tied to the relaxation of other regulatory burdens that place the exchanges at a disadvantage relative to the less-regulated OTC markets.

In a major policy shift, the new chairman of CFTC, William Ranier, recently proposed abandoning the contract market requirement for financial futures and allowing exchanges to introduce such contracts without first obtaining CFTC's blessing. Ranier also stated clearly that the Commodity Exchange Act "was not designed to regulate the OTC market." Such regulatory changes would enhance competition and thereby reduce the need for more intrusive regulation.

In brief, the transformation of exchanges from nonprofit institutions to for-profit ones should not in itself be a source of concern for regulators and legislators. The transformation is a rational response to fundamental changes in technology that need not affect the tension between the interests of exchange owners and users in any substantive way. The key issue insofar as regulation is concerned is whether the computerized marketplace will be more or less competitive than its open outcry predecessor. There is reason to believe that computerized exchanges will face more competition than do open outcry markets. If that happens, less regulation will be required.

## The transformation of exchanges from nonprofit institutions to for-profit ones should not in itself be a source of concern for regulators and legislators.

trading, liquidity suppliers can readily migrate between markets. And the costs of adding a new product to an existing computerized trading system are small: computer code for existing products is readily altered to accommodate new products, and computer systems are scalable so that capacity can be expanded to match increased demand.

In sum, there should be greater competition within and among for-profit electronic exchanges than there is with open outcry exchanges. Greater competition will foster more diligent self-regulation.

### CONCLUSION

THE PRECEDING ANALYSIS MAY BE TOO OPTIMISTIC. Economies of scale could result in the survival of a small number of trading systems that do not compete vigorously. Even so, the cause would lie in the trading technology, not the for-profit nature of exchanges.

It is hard to imagine how it could be efficient to force electronic exchanges to retain an organizational structure—the nonprofit form—that is ill-suited to the economics of computer trading. Impeding the adoption of the organizational form best suited to the electronic marketplace could delay the adoption of computerized trading. That would be very costly, indeed, given the potential efficiency of computerized trading.

Regulators should focus on the point that for-profit status will enable exchanges to raise capital needed to enter the world of electronic trading. That will foster greater competition, which will in turn lead to better self-regulation. Sadly, it seems more likely that regulators will attempt to micromanage exchanges and impede their efforts to adopt for-profit status.

The regulatory mindset is most clearly seen in the regulation of futures markets under the Commodity Exchange Act, which requires that all futures trading take place on a so-called contract market approved by the Commodity Futures Trading Commission (CFTC). Moreover, CFTC must

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