

An E-merging

WAITING FOR THE FUTURE TO ARRIVE: ELECTRONIC TRADING HAS THE POTENTIAL TO REVOLUTIONIZE

Revolution

COMMODITIES TRADING. HOWEVER, A NUMBER OF FACTORS — INCLUDING THE OWNERSHIP

in Agricultural

STRUCTURE OF U.S. AGRICULTURAL EXCHANGES — WILL HAVE TO BE OVERCOME TO SPEED ADOPTION.

Exchanges?

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In the mid-1800s, as grain trading began to expand in the United States, "to arrive" contracts became popular in the newly established Chicago Board of Trade (CBOT). River merchants, who purchased grain from farmers in the late fall, had to store the grain until moisture was low enough to ship it, and rivers and canals were free of ice. These early forward contracts allowed merchants to manage the price risk of storing grain over the winter. By late 1800s, "to arrive" contracts were formalized into standardized agreements called "futures contracts," and speculators were trading them alongside merchants and processors in numerous grain exchanges.

Since these early years, futures exchanges have been critical for price discovery and risk management in agricultural commodity trading. Traders essentially made a collective forecast of the current value of grains for future delivery, facilitating price discovery. Speculators, who account for almost all grain futures transactions, aid risk management. Agribusinesses can transfer price risk to speculators by hedging against the grain they own. Since futures prices and cash prices must converge on the date of delivery, agribusinesses can "lock in" a price well in advance of delivery, effectively limiting their risk. This system not only allows the coordination of supply and demand across time, but also across space. Since any two locations tend to trade at a predictable price relationship to an exchange, information on the price of future contracts acts as a basis for trading across regions.

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How Technology is Changing Exchanges

To understand the impact of electronic trading, it is useful to break down exchange operations into three sequential processes: order, execution, and settlement. First, a customer's order must be communicated to the

trader so it can be executed. Most exchanges and brokerages have already automated this operation. It is increasingly common for floor traders to receive orders from their brokerage house, in real time, through a palm computer.

Settlement, on the other hand, encompasses all operations after a transaction is executed, from registering to clearing the trade. This process is also largely electronic, allowing the transaction's registration and maintenance to be electronically communicated with the brokerage houses.

It is the process of execution that has proven to be the most difficult to automate. This characteristic

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makes it the critical element in providing a fully electronic trading system.

In traditional exchanges, execution is the physical transaction of contracts that occurs on the exchange floor. This so-called "open outcry" system involves traders signaling and shouting orders amongst, not to mention against, each other. Electronic trading removes this transaction from the pit floor and places it inside a computer network, often referred to as a "matching engine." Electronic execution allows a seller's posted "bid" to be matched with a buyer's "ask," or offer. When a match occurs, the contract is automatically formalized, processed, and sent back to the brokerage house or trader.

The computerized system automates many of the human activities needed to complete a transaction, displacing not only the floor traders, but also much of the

Many international exchanges have been quick to capitalize on electronic trading. With few exceptions, all exchanges that have opened in the last two decades have quickly become fully automated, utilizing the technology as a means of entering the market and growing their share (e.g. EUREX, Tokyo Grain Exchange, and Korean Stock Exchange).

support staff required for handling orders. Efficiencies from scale and scope economies, however, may be far more significant than efficiencies arising from decreased intermediation. While the up-front costs of developing an electronic trading platform are relatively high, the marginal costs of additional transactions on an existing electronic trading platform are often trivial. The costs of developing and launching entirely new contract offerings

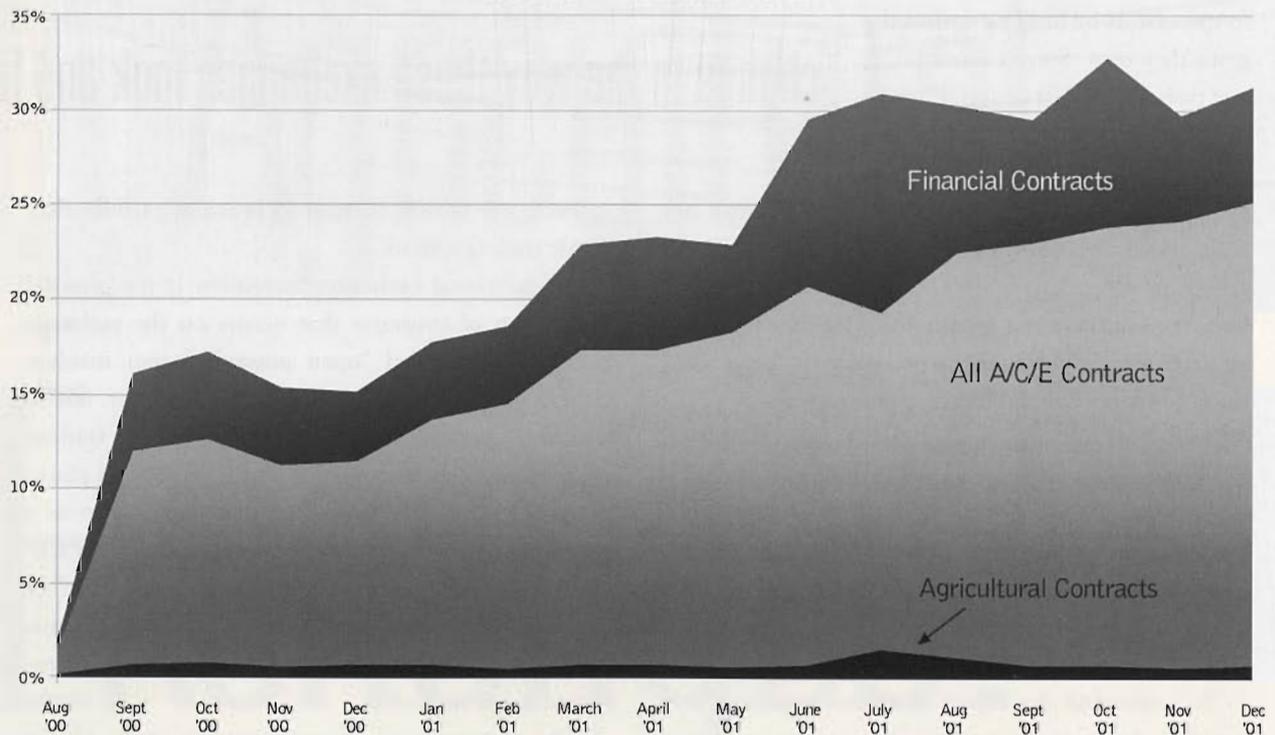
are also rather modest. This cost structure favors large exchanges. Hence, while scale and scope economies have always been important for agricultural exchanges, the potential for significant expansion of such economies through electronic trading paints a "winner takes all" picture of the market and will likely increase the pressure on exchanges to compete for a dominant position.

The Friction of Change

As with every radical technological innovation that provides an improvement, the old way must be supplanted, often causing conflicts. While electronic trading platforms have been developing rapidly around the world, the transition from open-outcry to electronic trading has been difficult for U.S. exchanges.

Perhaps the most significant barrier to electronic trading has been the ownership structure of U.S. exchanges. Historically, exchanges have been structured as non-profit organizations where members (brokers and traders) purchase "seats" on the exchange for the

Figure 1. Percent of Electronic Volume (A/C/E) vs. Open Outcry on the CBOT
Aug. 2000 – December 2001



right to engage in trading. Within this structure, members control the assets and governance of the exchange. However, electronic trading threatens to disintermediate these member-owners and render them obsolete. Member-owners may then have an incentive to resist electronic trading, even though the long-term success of the exchange could be compromised. This conflict of interest creates a situation where it is often hard to discern what is best for the member-owners, what is best for the exchange itself, and whose interests should take precedence.

This principal-agent problem is currently being tackled by shifting the ownership structure of exchanges from mutual, or member-owned, to demutualized, or shareholder-owned. However, the process of demutualization is not straightforward. Members must be reimbursed for the revenue stream they expect from their "seat." Typically, reimbursement has come in the form of stock in the demutualized exchange. Member expectations about the returns from such stock allocations affect their interest in demutualization, as well as the level of intra-organizational friction.

Until recently, regulation was also a barrier to demutualization, because the long standing Commodity Exchange Act favored the not-for-profit governance structure. However, the Commodity Futures Trading Commission recently approved demutualization for the CBOT, Chicago Mercantile, and New York Mercantile exchanges. The shift in regulatory emphasis has eased the transition of incumbent exchanges to electronic trading and has invited new entrants in the industry, such as the new electronic futures exchanges Futurecom (cattle contracts) and the Merchants' Exchange of St. Louis (barge rate contracts).

As agricultural futures exchanges demutualize, economic viability becomes a key concern. Historically, exchanges have generated operating capital through the sale of "seats" for trading, as well as through membership dues. With members out of the equation, the individual trades become the centers of profitability. This is a difficult position to be in, because the marginal trans-

action costs of electronic trades are miniscule. Competition could drive trading fees close to those marginal costs, as electronic exchanges increasingly provide open access to their matching engines to compete

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for liquidity. This limits trading fees, which is where demutualized exchanges often expect to generate revenues.

Strategies for Change in the Exchange

To relieve some of the pressures of the transition towards electronic trading, some incumbent exchanges have opted to employ electronic and open outcry platforms simultaneously. This two-platform system allows an exchange to keep from alienating existing members while it accumulates experience in electronic trading.

Two principal models of dual trading have been tested over the last few years. Early on, electronic trading was used for after-hours transactions (e.g. CBOT's past use of Project-A). More recently, a tandem side-by-side system has been employed (e.g. CBOT's EUREX listings and the Chicago Mercantile's GLOBEX2 listings). Of course, gradual transition is not without its own costs. The two trading mechanisms often compete against each other, suffering mutual loss of liquidity — not to mention revenue — from their overlapping functions. Furthermore, having two costly platforms instead of one can only be sustainable in the short term.

Another transition strategy involves forming horizontal alliances to share a common electronic trading platform. Such alliances allow exchanges to share the up-front costs of technology development, pool contracts and liquidity, and begin to exploit the scale and scope

economies afforded by electronic trading. Horizontal alliances are already having a significant effect on industry structure, consolidating independent exchanges around few dominant networks, such as the EUREX, and the Chicago Mercantile Exchange/GLOBEX2.

Agriculture and the Limits of Electronic Trading

While electronic trading of financial instruments has grown rapidly in recent years, electronic trading of agri-

kets, can occur when large commercial entities believe they are near the completion of a large international grain deal. Large international deals can affect the entire market, and the firm with this "inside" information may act on it by opportunistically buying/selling grain before any information is released. The dynamics of the open-outcry market effectively limits the opportunistic value of insider information, while electronic trading, with its increased speed and liquidity may not. Since each electronic trade, in volleys of thousands, can be completed in

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cultural contracts has seen little growth. For instance, agricultural contracts on the CBOT/EUREX platform (called the A/C/E) are trading at less than one percent of the volume of their open outcry counterparts, while financial contracts are trading in excess of 30 percent (Figure 1). This disparity can be attributed to a number of limiting factors unique to agricultural commodity trading.

The need for physical delivery of agricultural products is a significant limiting factor. The scale and scope economies permitted by electronic trading call for increased market connectivity. Yet such economies may be difficult to capture, especially when agricultural products must cross political boundaries. Country-specific agricultural, trade, and regulatory policies often hamper product standardization and trade, a problem that is not experienced by financial products. The resulting small and separated futures markets have not had the ability or need to participate in globally connected markets.

Another factor limiting interest in electronic trading of agricultural commodity contracts is the perceived need for physical presence in the market place. Agricultural commodity exchanges, for instance, are not subjected to the same insider trading legislation as securities. Insider trading, called "anticipatory hedging" in agricultural mar-

kets, can occur when large commercial entities believe they are near the completion of a large international grain deal. Large international deals can affect the entire market, and the firm with this "inside" information may act on it by opportunistically buying/selling grain before any information is released. The dynamics of the open-outcry market effectively limits the opportunistic value of insider information, while electronic trading, with its increased speed and liquidity may not. Since each electronic trade, in volleys of thousands, can be completed in

Looking to the Next Frontier

Organizational and institutional constraints continue to pose challenges for full electronic trading of agricultural futures and options suggesting that trading via open-outcry will likely continue for some time. Despite such challenges, electronic trading seems inevitable. Spillovers from ongoing innovation in electronic trading of financial contracts will continue to lower both the costs as well as organizational and institutional constraints to electronic trading of agricultural commodities. Competitive pressures from incumbents and new entrants pursuing economic gains allowed by electronic trading will ultimately drive the transition of the industry.

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