



Adoption of electronic trading at the International Securities Exchange

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Available online 19 November 2004

Abstract

Information technology is transforming financial trading, lowering costs, and increasing market transparency. Yet, new electronic trading ventures often fail to attract sufficient activity levels, and close down. Optimark, Tradepoint, Jiway, and BondConnect did not develop sufficient trading volume to survive. In contrast, the International Securities Exchange (ISE), an all-electronic options trading platform has gained trading volumes in the United States in competition with four incumbent markets, including the Chicago Board Options Exchange (CBOE). Compared with floor exchanges, electronic options markets offer immediate trading, direct user access to the market, and reduced costs. The paper describes the ISE and examines newly available data from brokerage firms to comply with the Securities and Exchange Commission's (SEC) Rule 11Ac1-6. The order routing disclosures show that brokerage firms differ widely in the extent of their use of the ISE. Based on a sample of 188 quarterly disclosures from 20 major brokerage firms, OLS, Tobit, and fixed-effects models of ISE use are estimated to explain individual firms' adoption levels. Significant factors are whether the firm is an online discount broker, the firm's membership role in the ISE, and the network externality effect of the ISE market's growth. Firm-specific factors are shown to account for about 60% of ISE adoption explained by the model, with the remaining 40% accounted for by the network effects of growing market liquidity.

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Keywords: Electronic markets; Options exchange trading systems and technology; Exchange memberships; Brokerage firm order routing; Market share models; Adoption models

1. Introduction

This paper examines the adoption patterns of U.S. securities brokerage firms for electronic equity options trading after the launch of the International

Securities Exchange (ISE), an all-electronic trading platform on May 26, 2000. In the first quarter of 2004, the ISE handled 29.2% of all U.S. equity options contracts traded and 33.2% of equity options transactions, with the four incumbent options exchanges accounting for the remainder (source: Options Clearing). Quarterly data for a sample of 20 brokerage firms from 3Q 2001 to 1Q 2004, however, reveal wide variation in the extent of ISE use, from 0% to as high

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as 61% of a firm's options orders in a quarter. Understanding what influences potential users to adopt a new electronic market has research value and practical implications for developers of new trading platforms. We look at how broker-specific and network-effect variables impact ISE use by brokerage firms.

In the United States, the ISE is a competitor of four established floor-based exchanges in Chicago, New York (American Stock Exchange), Philadelphia, and San Francisco (Pacific Exchange). The largest of these, the Chicago Board Options Exchange (CBOE), began operating in 1973, and has a competing market maker structure with a floor trading crowd of 1437 that can provide for price and size improvement, and complex, linked transactions such as spreads and straddles in which several options are purchased and sold simultaneously.

The ISE's electronic market offers first in–first out (FIFO) time priority among orders at a particular price, and initially undercut the trading fees charged by the floor options exchanges. Transactions on the ISE are free to the brokerage firm and its customer. ISE market maker members are charged about 20 cents per contract traded, and the turnaround time on many orders to the ISE is less than 1 s. Before the ISE launch, floor option exchanges were charging fees about 50% higher than the ISE, but have since lowered fees to match those charged by the ISE. Floor orders can take anywhere from 15 s to several minutes to execute and report to the client, depending on the order and market conditions at the time.

At the time of its launch, the prospects for the ISE were unclear. James Marks, an analyst with Credit Suisse First Boston commented in the October 1, 2000 edition of *CIO Magazine*: “It's a bit of a chicken-and-egg situation for the ISE. To get order flow, they need liquidity-willing buyers and sellers—but to get liquidity they need order flow. Better, cheaper, faster won't mean much if they don't get the critical mass of order flow they need to keep their market makers and the brokerages happy.” Research into the factors that determine whether an electronic market will succeed is inconclusive. Kambil and Van Heck [14] describe the few examples of online financial and commercial B2B markets that have succeeded. The authors contend that success results largely from integrating product transactions with

information and services, such as logistics and payment support, and providing value, not just lower prices, to all market participants. Hendershott [13] examines the uneven adoption of electronic financial trading, and uses Electronic Communication Networks (ECNs) for Nasdaq stocks and currency dealing systems as examples of electronic trading successes. Bond markets though remain largely dependent on telephone contact for trading. Barclay et al. [1] examine competition between Electronic Communication Networks (ECNs) and Nasdaq market makers for trading, and conclude that multimarket trading offers benefits and that ECNs are not a complete substitute for trading with a traditional market maker.

Well-designed trading automation is beneficial to investors and traders in markets [16,17]. For example, the introduction of the Nasdaq screen market in 1971 to replace the OTC “pink sheets” led to a reduction of the average bid-ask spread (an important transactions cost in financial markets) in a 174 stock sample to 40.3 cents from 48.7 cents [12]. The introduction of the SEAQ screen-based market system as part of the London Stock Exchange's 1986 Big Bang market reforms improved the quality of the LSE market [4], and played a part in trading volumes increasing from \$280 million a day in 1985, to \$4.1 billion a day in 1994. Comparing SEAQ to the floor, London's electronic market proved to be more open and competitive than the floor market, and led to lower transactions costs for investors. In spite of advantages, however, many new electronic trading platforms fail to attract sufficient market activity to survive.

Researchers have recently identified further opportunities for exploiting IT, and specifically the Internet, for financial trading. Established order routing practices in many brokerage firms, though, can hinder the adoption of the most efficient trading practices, and thus reduce the incentive to introduce trading system innovations. As Fan et al. [9] points out “The vertical relationships between the brokers and the market centers adversely affect investors' interest and undermine the competition at the exchange markets. These relationships also reduce the incentive for market centers to innovate to offer more efficient trading services.” An obstacle facing a new market, such as the ISE, is how to attract sufficient order flows when many brokers have existing relationships with floor exchanges [11].

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