

Department of Information Systems
London School of Economics and Political Science



Working Paper Series

73

Michael Barrett and Susan V. Scott

**“The Emergence of Electronic Trading in Global Financial Markets:
Envisioning the Role of Futures Exchanges in the Next Millennium”**

May 1999

Department of Information Systems
London School of Economics
Houghton Street
London WC2A 2AE
telephone +44 (0)171 955 7655
fax +44 (0)171 955 7385
e-mail is@lse.ac.uk
home page <http://is.lse.ac/>

THE EMERGENCE OF ELECTRONIC TRADING IN GLOBAL FINANCIAL MARKETS: ENVISIONING THE ROLE OF FUTURES EXCHANGES IN THE NEXT MILLENNIUM

Michael Barrett*

Department of Accounting and MIS
University of Alberta

Susan V. Scott*

Information Systems Department
The London School of Economics

Abstract

This paper describes our case study based research exploring the shift from traditional 'open-outcry' to electronic trading in the major futures Markets in London and Chicago. We outline the emergence of electronic trading in these Markets, with the aim of examining the influences that will shape the operation and interaction between major global futures exchanges in the electronic markets of the new millennium. Our empirical work has sensitised us to the usefulness of conceptual ideas on the local/global dialectic in the process of globalisation, and the shifting nature of risk in analysing the emergence of electronic trading in major global futures markets. In our discussion of the current status of the project we seek to connect the local issues concerning electronic trading to their broader social, economic and political context. We conclude by suggesting how our findings can be expected to contribute to IS theory and practice.

Keywords: Interpretivist perspective, computers and society, globalization of IS, financial sector, organizational change

* The authors names are given in alphabetical order, both authors contributed equally to this paper.

This paper has been submitted to the
European Conference on Information Systems, Vienna, Austria 2000
research-in-progress paper.

© Please do not quote without authors permission

1. INTRODUCTION

The widespread adoption of information and communication technologies has been recognised as critical to the development of new international financial systems (Castells 1996, Leyshon and Thrift 1997). Across a number of sectors, such as international insurance markets (Barrett 1999) and stock exchanges (Clemons and Weber 1990), electronic trading infrastructures facilitate functional integration and interdependence across markets in a global economy. This has affected market structures and enabled the creation of new electronic markets (Malone, Yates, and Benjamin 1989, VAN Heck and Ribbers 1996).

Our research focuses on the adoption of electronic trading by major international futures exchanges. Futures exchanges are self-governing membership associations, which serve as an umbrella for member firms and provide opportunities for risk management and the establishment of efficient market prices. Recent work on electronic trading in futures markets has been narrowly focused on technical and financial concerns of efficiency and liquidity (Pirrong 1996, Chow, Lee, and Shyy 1996). Other related work examines the economic effects of commodity trading in electronic markets, focusing on characteristics such as buyer search costs, network externalities, and switching costs (Bakos 1991, 1997). While such work aims to understand the specific mechanisms and functional consequences of electronic trading on futures markets, our approach is broader and considers the activities within markets as dynamically linked with their social, economic and political contexts.

The broad objective of our study is to examine how the major international financial futures exchanges will operate and interact with one another in the new millennium, and what role electronic trading is playing in these relationships. As such, our inter-related research questions address key issues at multiple levels: firstly, what is fuelling the emergence of electronic trading strategies amongst major futures exchanges? Secondly, what are the potential consequences of these strategies for key stakeholders linked with these exchanges?

2. THEORETICAL FOUNDATIONS OF THE PROJECT

Our fieldwork sensitized us to the challenges felt by different stakeholders within and across the major futures exchanges in responding to processes of globalization and the '24-hour trading day' in an increasingly uncertain world. In order to present our analysis in a coherent theoretical context, we decided to draw upon recent social theories concerning emerging processes of globalisation (Albrow 1996; Gray 1999), and the changing nature of risk in recent times (Giddens 1991; Beck 1992).

Although there is widespread agreement that information and communication technologies are deeply implicated in processes of globalization (Castells 1996; Albrow 1996), there are many debates concerning their role in such processes (Barrett, Cooper, Hinings, Hughes, Krahn, Lowe 1997). Uni-directional and technologically deterministic views of globalization (Ohmae 1990) have been challenged by literature that views globalization as a complex process constituted by a local/global dialectic (Giddens 1990).

It is suggested that globalization involves greater interconnectedness, involving the 'intensification of worldwide social relations which link distant localities in such a way that local happenings are shaped by events occurring many miles away and vice versa' (Giddens 1990; Gray 1999). Even though there is a penetration of locales by distant others, locales are not necessarily destroyed by globalization, rather: 'new forms of local resistance and local expression emerge, reinforcing the interconnectedness of the local and the global, and the multiplicity and hybridization of social life' (Yeung, 1998).

Whilst the local/global dialectic is emphasised in this stream of literature, the importance of actors' interpretations and actions in mediating this dialectic is not adequately recognized

(Barrett and Heracleous 1999). Drawing upon Giddens (1984), we intend to suggest that the daily appropriation and interpretation of new technologies is an important influence in shaping emerging global processes and structures. Furthermore, it is proposed that one of the most powerful aspects in this, is their differing perception of risk at multiple levels, which is enabling and constraining visions of electronic trading in global futures markets.

2.1 THE SHIFTING NATURE OF RISK

Although the research project focused upon computer-mediation of futures trading involving a *financial* model of risk, it was found that shifting to a more abstract concept of risk highlighted important political, social and economic issues informed our analysis. The concept of risk has been considered at an abstract level by certain social theorists who have developed a thesis relating to the social construction of risk and identity in society (Giddens 1990; 1991; 1994; Beck 1992; 1994; Franklin 1998).

Beck (1992) defines risk as ‘a systematic way of dealing with hazards and insecurities induced and introduced by modernization itself’. In a world increasingly characterized by change and uncertainty, actors are demanding new ways of systematically managing risk in their ecology; whether that be business people concerned about the effect of unexpected world events upon exchange rates, or farmers caught up in potentially devastating consequences of global climate changes.

Futures exchanges are providing opportunities for an emerging market targeted at the management of risks associated with modernization. Globalizing side-effects of ‘techno-economic progress’ (Beck 1992) may be an important source of increased demand for futures products offered by international exchanges in the next millennium. For example, during our fieldwork in Chicago we witnessed the first day of trading in futures products designed to hedge risks that may arise from air pollution.

Finally, it is suggested that perceptions of increased personal and professional risk involved in the transformation of futures trading are key to understanding the response of actors’ to the challenge of electronic trading. It is not just the supremacy of the major futures exchanges that is being questioned, but their very survival, as electronic trading facilitates the redefinition of expertise within the industry.

3. METHODOLOGY

The findings in this paper are based upon a research project that we are conducting using a process-based approach (Pettigrew 1985; 1990; Walsham 1993). It is organised around a longitudinal case study, the first phase of which took place in London and Chicago during 1998. The study was motivated by media reports indicating that radical changes, primarily linked to the introduction of electronic trading, were about to take place at the London International Financial Futures and Options Exchange (LIFFE). We became interested in the implications of this for major global exchanges and their traders.

In our fieldwork design the primary method for gathering data was extensive in-depth interviews with project stakeholders and key figures in the industry. A set of basic interview questions was developed which covered a variety of issues. These were tailored for different stakeholders in London and Chicago, but an emphasis on perceived benefits and drawbacks relating to the shift to electronic trading remained the same for each interview. So far, the fieldwork has involved a total of 15 formal semi-structured interviews conducted on-site at the interviewee’s premises (see appendix).

In addition to this, we attended the Futures Industry Association (1998) three-day conference in Chicago, which had chosen to adopt electronic trading as its focus. Key industry figures formed panels to discuss the implications of electronic trading. Furthermore, organizational

documentation from exchanges, traders, banks and clearing houses was studied, and a week was spent observing the trading floors in Chicago.

We are in the process of analysing the empirical material, attempting to identify ‘tendencies’ (Bhaskar 1979) that have emerged in the course of the research, which help us to make sense of the data. We are organizing these into logical clusters with the aim of communicating them in the form of issues, themes and concepts held within the coherent analytical context offered by social theory.

4. CURRENT RESEARCH

In this section of the paper, we will draw upon empirical material gathered in phase one of the research project and historical reconstruction to present a brief, but critical outline of the emergence of electronic trading. Trading on the major futures markets is conducted through a system of open outcry backed up by hand signals. Electronic initiatives have been regarded as a supplementary, after-hours mechanism by the major exchanges. One of the most significant early attempts to introduce electronic trading to the Chicago markets was initiated by the Chicago Mercantile Exchange in 1987.

Globex is most closely associated with the then CEO of the CME, who sought to both protect his exchange’s position as a leading world market against competition by foreign exchanges and pursue his vision of a single global marketplace.

‘We told them that globalization were upon us, that our markets moved with the sun...The problem I encountered at the Merc was clearly being encountered by every other exchange in the world. ... Every exchange had its own products that were peculiar to their country and nationality but weren’t patentable and could then be cannibalized by another time zone. ... How do we protect ourselves? Well, Globex intended to do that...I wanted everybody on it. I wanted it to be a world system. In my view, a sort of unified theory of trade.’
(Former CEO of CME 1998).

However, the goals of Globex have been the object of controversy amongst exchanges. A complex combination of negative influences, typical of the obstacles encountered by electronic trading initiatives at the major exchanges, contributed to the collapse of Globex in 1992.

Electronic trading remained the ‘political impossible’ (Former CEO of CME 1998) because, as one interviewee put it, ‘Turkeys don’t vote for Christmas’ (MD, Strategic development, LCH 1998). It threatened to effectively sweep away the work and work life of local traders, the ‘market makers’, so vital to the liquidity of futures markets. It would demand a shift away from the lay skills of quick-witted ‘barrow boys’ in the pit, toward the rarefied rational-scientific expertise of graduates. Players around the physical pits would no longer be at the epicenter of market intelligence. The very understanding of what constitutes expertise within futures markets will have to be redefined, relocated and embodied by ‘a new breed of broker’ (Joint Head of Capital Markets 1998). Indeed, in theory at least, electronic trading could ‘disintermediate’ the futures exchanges altogether.

Such thoughts had been regarded as wild imaginings, until LIFFE lost one of its benchmark products (the German bund contract) to a rival exchange, the Deutsche Terminborse (DTB). The DTB offered traders a more competitively priced transaction via its electronic trading systems. In July 1998, LIFFE announced its strategic response, to implement a state-of-the-art computer-based information system over the next 18 months, to enable its members to trade key financial products electronically. LIFFECONNECT was designed to ‘overcome most, if not all of the operational issues that exist within the current trading environment’

(LIFFE 1998). Although the LIFFE board were not prepared to say that open outcry had no future, the compulsory redundancy of 60% of the LIFFE staff in 1998 did little to reassure. Around the world, exchanges were positioning themselves for the adoption of electronic trading, and traders were described as moving into a 'comfort zone' with electronic trading practices (Project Manager, CBOT Project A).

Although the leaders of the Chicago exchanges recognized a global trend towards electronic trading, there were too many stakeholders dominating their governance structures for whom it represented upheaval or redundancy. However, they were ignoring fundamental pressures building up in the trading community. Firstly, as demand for futures trading grew the physical limits on pit size was becoming apparent:

'Pits can only operate within a certain size...Its like you are in a football stadium...how could you trade with someone across the field?'

(Local trader and MD 1998).

Secondly, both traders and regulators were slowly learning to appreciate the transparency provided by electronic trading where both the bid and the size of the trade can be seen. Thirdly, information technologies enable the trader to construct automated strategies and adopt complex trading positions, which could then be executed far quicker than even the best pit trader. Finally, electronic trading cuts the cost of execution because there is less need for support staff in the exchange.

Ironically, rather than proactively move toward electronic trading the major Chicago exchanges publicly restated their belief in open outcry.

'The sense here is how do we protect our pits. It is, still circle wagons and keep the enemy out!'

(Local trader and MD 1998).

However, as a partner at a major consultancy firm in Chicago said:

'To make a successful transition, exchanges must set a course that ensures they are adding value as the markets go electronic and global. Those who stand pat risk having others define their role or being cut out of the process altogether'.

(Winne quoted in Futures Industry, 1998)

In 1998 a New York based brokerage company launched an electronic trading system designed to compete directly with the trading facilities offered at the CBOT. The CBOT responded to this rude wake-up call, proclaiming that they must be 'be competitive and visionary to remain the industry leader...[and will] make a preemptive strike on any entity that might emerge as a competitor' (CBOT 1998). The CBOT membership voted overwhelmingly to prioritize the development of electronic trading, and provide 24hr side-by-side access to their electronic trading system, Project A. In an interesting political move, however, they ensured that their computerized trading system had the capacity to both execute electronically *and* route orders to open outcry in the pits via a hand held device given to brokers.

Since then, key players in the major exchanges have been pursuing strategic alliances with renewed vigor, culminating in the formation of three competing 'dynasties' (MD, Strategic development LCH 1998). Firstly, the CBOT agreed to form an alliance with EUREX, a coalition consisting of the DTB and the Swiss futures exchange SOFFEX, to share the development costs of a state-of-the-art electronic trading system and establish a 'non-compete' arrangement on their respective benchmark products. Secondly, the CME have launched 'Globex 2' with the Paris exchange, based around MATIF's electronic trading system NSC. Finally London, in a characteristically aloof and independent manner, is

launching its own state-of-the-art electronic trading system LIFFECONNECT, due to go live in July 1999. One interviewee described the current situation as follows:

‘It’s a bit like World War III, but without the ammunition. You are fighting with capital, rather than with guns. We are really talking about geopolitical forces’.

(MD, Strategic development LCH 1998)

It is now widely believed that the ‘political impossible’ is becoming a ‘political reality’ that has to be faced in order to avert further crises (Former CEO of the CME 1998).

5. CONCLUSIONS

The crisis surrounding a potential landslide towards widespread adoption of electronic trading in the futures industry has intensified the tension between local interests and increasing demands from global competition. Electronic trading offers opportunities for access to markets by commercial entities beyond the boundaries of the futures exchange. Actors in the major exchanges are drawing upon their local expertise to construct alliances and develop technology designed to protect their pits and strategically position them for the future. We suggest that making sense of risk should include an analysis of the options, decisions, politics, ethics, as well as the technologies, markets and capital surrounding them. The next phase of the electronic trading strategies at the major exchanges will be implemented in 1999, and we hope to be able to update and elucidate our analysis at the conference.

REFERENCES

- Albrow, M. *The Global Age: State and Society Beyond Modernity*, Cambridge: Polity Press, 1996.
- Bakos, J.Y. "Reducing Buyer Search Costs: Implications for Electronic Marketplaces," *Management Science* (43:12), December 1997, pp. 1676-1692.
- Bakos, J.Y. "A Strategic Analysis of Electronic Marketplaces," *MIS Quarterly*, September 1991, pp. 295-310.
- Barrett, M. "Challenges of EDI adoption for electronic trading in the London Insurance Market," *European Journal of Information Systems*, (8), 1999, pp.1-15.
- Barrett, M., and Heracleous, L. "Globalization as a Structural Process in the Context of the London Insurance Market," *Forthcoming in the Academy of Management Conference Proceedings*, Chicago, August 6-9, 1999.
- Barrett, M., Cooper, D., Hinings, C.R., Hughes, K., Krahn, H., Lowe, G. "Understanding Information Technology, Globalization and Changes in the Nature of Work". *Workshop Proceedings*, University of Alberta, Edmonton, 1997.
- Bhaskar, R. *The Possibility of Naturalism: A philosophical critique of the contemporary human sciences*, Harvester, Brighton, England, 1979.
- Beck, U. " Politics of Risk Society," in J. Franklin (ed.), *The Politics of Risk Society*, Polity Press, Cambridge, 1998, pp. 9-23.
- Beck, U, Giddens, A.; and Lash, S. (eds.), *Reflexive Modernization: Politics, Tradition and Aesthetics in the Modern Social Order*, Polity, Cambridge, England, 1994.
- Beck, U. *The Risk Society: Towards a New Modernity*, Sage, London, 1992.
- Bernstein, P. L. *Against the Gods: The remarkable story of risk*. Chichester, Wiley, 1996.
- Castells, M. *The Rise of the Network Society*, Blackwell, Cambridge MA, 1996.
- Chicago Board of Trade. "Agricultural Futures for the Beginner," *CBOT publication*, General Information Series 1, Chicago, USA, 1996.
- Chicago Board of Trade. "Open Outcry and Electronic Trading: Side-by-side trading," *CBOT publication*, Chicago, USA, 1998.
- Chow, E.H., Lee, J., and Shyy, G. " Trading Mechanisms and Trading Preferences on a 24 – hour Futures Market: A case study of the Floor/Globex switch on MATIF," *Journal of Banking & Finance* (20) 1996, pp. 1695-1713.
- Clemons, E.K., and Weber, B.W. "London's Big Bang: A case study of information technology, competitive impact, and organizational change," *Journal of Management Information Systems* (6:4), 1990, pp. 41-60.
- Franklin, J. *The Politics of Risk Society*, Polity Press, Cambridge, 1998.

Futures Industry: The Magazine of the Futures Industry Association. Special edition on electronic trading called "Brave New World". Including the official program for the Futures and Options Expo 1998, Oct/Nov. New York, USA, 1998

Giddens, A. "Risk Society: The Context of British Politics," in J. Franklin (ed.), *The Politics of Risk Society*, Polity Press, Cambridge, England, 1998, pp.23-35.

Giddens, A. "Risk, Trust, Reflexivity," in U.Beck, A.Giddens, and S. Lash (eds.), *Reflexive Modernization: Politics, Tradition and Aesthetics in the Modern Social Order*, Polity, Cambridge, England, 1994.

Giddens, A. *Modernity and Self-Identity: Self and society in the late modern age*. Polity Press, Cambridge, England, 1991.

Giddens, A. *The Consequences of Modernity*. Polity Press, Cambridge, England, 1990.

Giddens, A. *The Constitution of Society*. Polity Press, Cambridge, England, 1984.

Gray, J. *False Dawn: The Delusions of Global Capitalism*. London: Granta Books, 1999.

Leyshon, A., and Thrift, N. *MoneySpace*. London: Routledge Press, 1997.

London International Financial Futures and Options Exchange "LIFFE Connect – an introductory overview", *LIFFE publication*, London, UK, 1998.

Malone, T.W., Yates, J.; and Benjamin, R.I. "The Logic of Electronic Markets," *Harvard Business Review* (67:3), May-June 1989, pp. 166-170.

Ohmae, K. *The Borderless World: Power and strategy in the interlinked economy*. London: HarperCollins, 1990.

Orlikowski, W. J. "The duality of technology: Rethinking the concept of technology in organizations". *Organizational Science*, (3:3), 1992, pp. 398-427.

Pettigrew, A. M. *The Awakening Giant: Continuity and change in ICI*. Oxford, Basil Blackwell, 1985.

Pettigrew, A. M. "Longitudinal field research on change: Theory and practice". *Organization Science* (1:3), 1990, pp. 267-292.

Pirrong, C. "Market Liquidity and Depth on Computerized and Open Outcry Trading Systems: A Comparison of DTB and LIFFE Bund Contracts," *The Journal of Futures* (16:5), August 1996, pp. 518-543.

Tamarkin, B. *The Merc: The emergence of a global financial powerhouse*. New York, Harper Collins, 1993.

VAN Heck, E. and Ribbers, P.M.A. "Positive and Negative Effects of Electronic Markets: Four Case Studies in the Dutch Flower and Transport Industries," *Proceedings of the 4th European Conference on Information Systems*, Lisbon, Portugal, July 2-4, 1996.

Walsham, G. *Interpreting Information Systems in Organisations*. Chichester, John Wiley, 1993.

Winne, B.W. "When the Platform becomes the Product," in *Futures Industry*, The Magazine of the Futures Industry Association, New York, USA, 1998, pp. 25-29.

Yeung, H. W. "Capital, State and Space: Contesting the borderless world". *Transactions of the Institute of British Geographers*, 23, 1998, pp. 291-309.

**APPENDIX: FORMAL INTERVIEWS
CONDUCTED IN FIRST PHASE OF FIELDWORK**

Respondent	Period
Project Manager Liffe Connect	August 1998
Managing Director Strategic Director London Clearing House	August 1998
Managing Director Electronic Trading Software Company	August 1998
Capital Markets Editor The Financial Times	August 1998
Futures and Options Manager Large International Bank	August 1998
Managing Director Information Technology Liffe	September 1998
Joint Head of Capital Markets Large International Bank	September 1998

Table 1: Summary of interviews conducted in London

Respondent	Period
Local trader	October 1998
Managing Director of small local trading company	Interviewed twice
Executive Vice President Planning and Operations CBOT	October 1998
Director of Marketing Electronic Trading Systems CBOT	October 1998 Interviewed twice
Managing Director Electronic Trading Order Routing CBOT	October 1998
Manager Visitor Center CBOT	October 1998
Chairman and Chief Executive Officer Major trading company (Former CEO of CME)	October 1998

Table 2: Summary of interviews conducted in Chicago