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Where do electronic markets come from? Regulation and the transformation of financial exchanges

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Abstract

The practices of high-frequency trading (HFT) are dependent on automated financial markets, especially those produced by securities exchanges electronically interconnected with competing exchanges. How did this infrastructural and organizational state of affairs come to be? Employing the conceptual distinction between fixed-role and switch-role markets, we analyse the discourse surrounding the design and eventual approval of the Securities and Exchange Commission's Regulation of Exchanges and Alternative Trading Systems (Reg ATS). We find that the disruption of the exchange industry at the hands of automated markets was produced through an

interweaving of both technological and political change. This processual redefinition of the ‘exchange’, in addition, may provide a suggestive precedent for understanding contemporary regulatory crises generated by other digital marketplace platforms.

Keywords:

financial markets | production markets | regulation | stock exchanges | technology | marketplace platforms

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Disclosure statement

No potential conflict of interest was reported by the authors.

Notes

1 We study the US case because it is an early instance of the regulated interlinking and routing of orders for securities exchanges, which later facilitated HFT activities. For a comparison of US regulations and those of the Market in Financial Instruments Directive (MiFID), see Boskovic et al. (2010); and for the relationship of algorithmic trading and MiFID, see Lenglet (2011).

2 This distinction may be seen as in the tradition of the ‘multiple market’ critique of the economic conception of markets described by Zelizer (1988).

3 The differing size of the diamonds in the fixed-role market represents the differing status of the sellers in typical production markets, in contrast with the standardization of buyers and sellers found in switch-role financial markets; see Aspers (2011).

4 In this formulation, the products of an exchange are services – specifically, ‘trading services’, a term not infrequently used in more specialized literature to describe what exchanges produce; for example, Schwartz and Francioni (2004, pp. 133–135).

5 The subdomain within economics focusing on fixed-role markets is that of industrial organization (IO) (Schmalensee & Willig, 1989). Some of the notions from contemporary industrial organization, such as multi-sided markets (Rochet & Tirole, 2006), are quite suggestive and can permit a good degree of theoretical complexity (despite their canonical examples including somewhat imaginary entities, like now-nonexistent ‘singles bars').

6 White has outlined and elaborated on this idea in many articles, beginning with White (1981a) and White (1981b) and culminating with the monograph Markets from networks: Socioeconomic Models of Production (White, 2002). Intermediary presentations on similar material include White and Leifer (1988), White (1988) and White (1992). White’s explicit influences from economics are manifestly not neoclassical theorists like Walras, but instead include Chamberlin on monopolistic competition (Chamberlin, 1933) and the signalling theory of Michael Spence; on Chamberlin, see Swedberg (2003, pp. 113–114).

7 For Smith’s distinction between goods and services, see Smith (1776).

8 Gadrey (2000) describes theoretical progress in the goods/services dichotomy, including those of Peter Hill, who points out the traditional weaknesses of neoclassical economics in the study of services: ‘Because services cannot be transferred from one economic unit to another, models of pure exchange economics of a Walrasian type in which existing goods are traded between economic units are quite inapplicable and irrelevant to services’ (Hill, 1977, p. 318).

9 The term ‘sociotechnical’ is analogous to the sense of sociomateriality in Orlikowski and Scott (2008), but we intend not to privilege any of the senses of technology-as-tool, technology-as-technique, technology-as-social and technology-as-volition, as in Mitcham (1994).

10 Gabrielle Hecht and Paul Edwards use the term ‘technopolitics’ to refer precisely to such a ‘hybrid form of power’ with ‘cultural, institutional, and technological dimensions’ (Hecht & Edwards, 2010).

11 Some studies in finance research that see the exchange industry in this way, taking an industrial-organization perspective, include Macey and Kanda (1989), Domowitz and Steil (1999) and Cantillon and Yin (2011).

12 Dobbin (1994) and Fourcade (2009, pp. 36–37) argue that the regulatory tradition in the United States (going back to the 1891 Sherman Antitrust Act) normalized oligopolies as inherently ‘competitive’ within legal discourse. It should also be noted that Aspers criticizes Fligstein for only considering the role of the state in production as opposed to financial markets (Aspers, 2009).

13 ‘Markets consolidate because traders attract traders. Trading is easiest and cheapest where most traders of an instrument or similar instruments trade. Liquidity attracts liquidity’ (Harris, 2003, p. 539).

14 ‘As the value to one trader of transacting on a given trading system increases when another trader chooses to transact there as well, such a system is said to exhibit network effects or network externalities’ (Domowitz & Steil, 1999).

15 The term continuous auction can thus be contrasted to the call auction, in which orders are aggregated and then later matched at periodic, prearranged times. For a classification of exchange trading systems based on empirical observation in the mid-1980s, see Cohen et al. (1986, pp. 16–37).

16 It is sometimes stated that Walras’s original model was designed on the actual call auction process of the late-nineteenth-century Paris Bourse. Walras states: ‘let us go into the stock exchange of a large investment centre like Paris or London’ (Walras, 1954 [1892, p. 84]). That the Paris Bourse ever functioned in a manner similar to Walrasian tâtonnement is disputed by Walker (2001).

17 The period of transition before the end of fixed commissions in 1975 is well-documented in Welles (1975).

18 These are referred to as ‘primary’ and ‘secondary’ markets in securities, respectively (Harris, 2003, pp. 209–210).

19 These intermediating firms are called the sell-side; one can think of them as intermediating between traders and/or their representatives (that is, the buy-side) and the exchange itself. This is to say, it is the trading services that the buy-side is buying and the sell-side is selling, not the securities themselves. Also note that this perspective on the exchange's products as a set of independent markets is a simplification; various factors (including prohibitions and fees) may encourage investor diversification within an exchange's markets as opposed to across them.

20 Seligman (1985, p. 7) describes the AMEX as a 'minor league' to the 'major league' NYSE.

21 There were also an array of independent dealer markets for trading securities; these 'over-the-counter' (OTC) markets were also known (in aggregate) as the 'third market'. Additionally, Rule 394 (later Rule 390) prevented NYSE members from effecting trades in the over-the-counter market (the dealer markets regulated by the National Association of Securities Dealers, NASD) (Seligman, 1995, pp. 505–516).

22 The term 'Listed' markets refers to financial markets hosted by the exchange (for example, NYSE, AMEX) on which a stock first made its IPO. 'Over-the-counter' refers to the trading of these and other stocks in settings not hosted by a formal exchange (SEC, 1963, p. 657). Sperry Rand was then one of the 'seven dwarves' of computer manufacturing in competition with IBM.

23 NASD was the self-regulatory organization (SRO) for OTC broker-dealers (Smith et al., 1998).

24 A 'block trade' is simply a large transaction – at least 10,000 shares, but often much more. On the founding of Instinet, see Pardo-Guerra (2014).

25 'We note our satisfaction with the manner in which the NASDAQ communications system has been operating and intend to continue to monitor its operations and development in order to determine whether any modifications may be necessary as the evolution of a central market system progresses' (Study of the Securities Industry, 1972, pp. 3447–3448).

26 The amendment relating to the National Market System is section 11A (Securities Acts Amendments, 1975, pp. 111–112).

27 The ‘C’ in the acronym “CLOB” occurs alternately as “central”, “composite” and “consolidated” in regulatory proceedings and academic literature from the mid-1970s through the 1990s.

28 The Last Sale Rule (originally rule 17a-15 in SEC Release 34-9850 in 1972) required the dissemination of trade execution information in exchange-listed and NASDAQ stocks on some real-time reporting system. (The ‘last sale’ is the last transaction price for a security, on any market.)

29 The Quote Rule is 240.11Ac1-1, ‘Dissemination of Quotations’. It required brokers/dealers to send their quotes to exchanges, and for those exchanges to make those quotes available.

30 The Display Rule is 240.11Ac1-2.

31 Before the Consolidated Tape Association, information on the last-sale price was provided by NYSE or AMEX ticker tapes or electronic displays (Seligman, 1984, p. 86).

32 Release No. 34-26708; File No. S7-13-89 (SEC, 1989).

33 Release No. 34-30920; File No. S7-18-92 (SEC, 1992).

34 Release No. 34-36310 (proposal), Release No. 34-37619A (final); File No. S7–30–95.

35 Release No. 34-39884 (proposal), Release No. 34-40760 (final); File No. S7–12–98.

36 Only partial online coverage was available for the SEC comment letters for these proposals; the majority of the comment letters were scanned from the National Archives II in College Park, Maryland (Accession No. 266-07-0121), converted to plain text (when possible) via OCR software and manually cleaned during reading for various conversion errors.

37 Adams’s 1969 patent is ‘Instinet communication system for effectuating the sale or exchange of fungible properties between subscribers', US3573747 A.

38 By contrast with the above perspectives, it is worth noting the relative weakness of the concept of performativity of economics in the case of the transformation of the exchange industry. In the construction of automated quotation and trade execution systems there is little neoclassical economic theory to be found, despite the (incorrect) possibility of imagining these systems as physical manifestations of a hypothetical

Walrasian equilibrium generator (this is to say that, in practice, continuous order matching via a CLOB does not correspond with Walras's depiction). In fact, Frederick Nymeyer, who submitted a CLOB-style patent around the same time as Smith, was inspired by Austrian economics, which denied the existence of a single market-clearing price (Pardo-Guerra, 2014, p. 22). Moreover, one finds little theory of industrial organization cited in the regulatory debates, besides the abstract invocation of notions of competition and fairness.

39 On phatic communication, see Jakobson (1960). In the 2000s, the competitive proliferation of 'maker-taker' pricing – which grants various rebates to either 'liquidity suppliers' (those 'makers' posting marketable limit orders) or, alternatively, to those 'takers' submitting the orders which match them – further complicated this notion of best execution (Foucault, 2012).

40 The exemplary case of this was, of course, the NASDAQ odd-eighths scandal (Christie & Schultz, 1994).

41 Harris (1991) gives an excellent discussion of liquidity.

42 Steven Wunsch's Arizona Stock Exchange was, at the time, the only proprietary trade execution system actually registered as an exchange.

43 The proposed rules are in SEC (1995); The final rules are in SEC (1996). The Limit Order Display Rule is Rule 11Ac1-4; the amended Quote Rule ('ECN Alternative' to 'Dissemination of Quotations') is Rule 11Ac1-1.

44 The NYSE had a higher latency of placing and cancelling orders.

45 For more on the effect of the Order Handling Rules, see Schwartz and Francioni (2004, pp. 229–230). According to Schwartz and Francioni (2004, p. 241), 'A market maker could use a Nasdaq system (SelectNet) to send an order it has received to another market maker or to broadcast the order to all market makers. As quote providers, an ECN could also connect directly into SelectNet. SelectNet included a negotiation feature that allows a participant (market maker or ECN) to accept, reject, or counter a received order'.

46 The phrasing 'non-discretionary methods', it is explained, is meant to distinguish matching algorithms from the activity at traditional block-trading desks which would

‘shop around’ and break up a customer order (SEC, 1998, p. 70851). For general remarks on Reg ATS, see Domowitz and Lee (2001).

Additional information

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