Estimating the profit markup component of the bid-ask spread: evidence from the London Stock Exchange

Eric J. Levin [a,*], Robert E. Wright [a,b,c]

[a] *Department of Economics, University of Stirling, Stirling, Scotland FK9 4LA, UK*
[b] *Centre for Economic Policy Research, 25-28 Old Burlington Street, London, England W1X 1LB, UK*
[c] *Institute for the Study of Labour, University of Bonn, D-53113 Bonn, Germany*

Abstract

In this paper the theoretical profit-maximising bid-ask spread, based in economic theory, is related to the excess demand curve (i.e., the difference between the slopes of the demand and supply curves), market concentration, and the degree of collusion. Empirical estimates of the slopes of the excess demand curves are substituted into this economic relationship in order to calculate the excess profit component of the bid-ask spread for all *Financial Times-Stock Exchange 100-Share Index* (FTSE100) stocks traded on the *London Stock Exchange* (LSE) in the period 1 August 1994 and 31 July 1995. The excess profit component in a Cournot–Nash equilibrium represents 11% of the observed bid-ask spread on average. © 2003 Board of Trustees of the University of Illinois. All rights reserved.

JEL classification: G12

Keywords: Profit-maximising; Bid-ask; Economic

The bid-ask spread, the difference between the "buying" price and "selling" price of stocks set by market makers in financial securities, consists of four components. The first component is the *order-processing cost*, which includes the "waiting costs", paper-work and administrative costs incurred by market makers who stand prepared to trade throughout the trading day in order to provide liquidity (see Demsetz, 1968). The second component is the *inventory holding cost*, which reflects the cost to liquidity providers of holding unbalanced portfolios[1] (see Amihud & Mendelson, 1980; Biais, 1993; Ho & Stoll, 1981,1983; Stoll, 1976). The third component is

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* Corresponding author. Tel.: +44-1786-46-7481; fax: +44-1786-46-7469.
E-mail address: e.j.levin@stir.ac.uk (E.J. Levin).
URL: http://www.stir.ac.uk/economics/staff.

the *adverse selection cost* required to compensate market makers for dealing with traders who have superior information (see Copeland & Galai, 1983; Easley & O'Hara, 1987; Glosten & Milgrom, 1985; Kyle, 1985). Empirical estimates that include these components of the bid-ask spread have been calculated by Affleck-Graves, Hegde, and Miller (1994); Brockman and Chung (1999); Brooks and Masson (1996); Franz, Rao, and Tripathy (1995); George, Kaul, and Nimalendran (1991); Huang and Stoll (1997); Lin, Sanger, and Booth (1995); Madhavan, Richardson, and Roomans (1997); Menyah and Paudyal (2000); Neal (1992); Porter and Weaver (1996); Snell and Tonks (1995, 1998) and Stoll (1989).

This paper focuses on a fourth component of the bid-ask spread, market-maker rent or *economic profit* (see Barclay, 1997; Barclay, Christie, Harris, Kandel, & Schultz, 1999; Barclay, Kandel, & Marx, 1998; Christie, Harris, & Schultz, 1994; Christie & Schultz, 1994; Hansch, Naik, & Viswanathan, 1999; Huang & Stoll, 1996; Weston, 2000). With respect to this component, it is important to make a clear distinction between "normal" and "economic" profit. Normal profit is a cost because it is by definition the minimum profit required to hold resources in the industry and it is necessary for the smooth functioning of competitive markets. Economic profit is profit in excess of normal profit and is not regarded as a cost because it is not required to maintain resources in the industry. Economic profit is caused by market power, indicates the presence of imperfect competition and signals the need for regulatory attention.

Empirical evidence of market-maker rents in the *NASDAQ* dealership market has been provided by Barclay (1997); Barclay et al. (1998, 1999); Christie et al. (1994); Christie and Schultz (1994); Huang and Stoll (1996) and Weston (2000). Their findings are based on empirical evidence of collusive avoidance of "odd-eighth" quotes, substantial reductions in bid-ask spreads following public disclosure of the issue and subsequent regulatory changes that exposed *NASDAQ* dealers to increased competition.[2] Kandel and Marx (1999) summarize the literature concerning the source of market-maker rents in terms of the minimum tick size that constrains spreads to exceed the marginal cost of market-making, vertical integration of brokers into market-making and order-preferencing arrangements whereby market makers pay brokers to divert their order flow to them. However, the empirical findings of dealer rents have not been checked against the limits implied by economic theory. In this paper, we examine the theoretical basis for a relationship between empirically observed bid-ask spreads and the theoretical "excess profit markup" of industrial organization (IO) theory where the "marginal cost" is the bid price and the profit-maximising selling price is the ask price.

Bid-ask spreads would be driven to zero by the law of one price in a perfectly competitive market with full information in which by definition supply and demand for stocks facing each market maker are infinitely price elastic. The presence of positive bid-ask spreads necessarily means that the demand and supply for stock facing market makers cannot be infinitely price elastic. This implies an imperfectly competitive market in which at least part of the bid-ask spread represents order-processing costs and compensation for losses sustained by trading with informed traders. However, part of the bid-ask spread may be an excess profit markup (or economic profit component to the bid-ask spread) that lies between a theoretically well-defined maximum for a group of market makers collusively acting as a monopolist and zero under Bertrand price competition. We analyze the relationship between market structure and price sensitivity of the excess demand curve for stock in order to ascertain the economic profit component of the bid-ask spread implied by the theoretical excess profit markup. The empirical