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A Bayesian analysis of dual trader informativeness in futures markets

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Abstract

We take a closer look at the question of whether dual traders in futures markets are indeed informed traders. Underpinning this question is the intuition that a dual trader's decision to trade on his own account is not random, but is *endogenously* determined by his expectations of trading profits related to this decision. We employ a simultaneous equations model with two endogenous variables: (1) the binary decision of own account trading (or not), and (2) the trading profit resulting from his own account trading. Our test of whether dual traders are informed traders comprises of estimating the correlation between the error terms of the two equations in our model, where one error term proxies for a dual trader's unobserved private information and the other captures his abnormal profit. Upon estimating the model, using the Bayesian approach, we find no evidence of significant correlation between a dual trader's private information and his abnormal profit. Overall, dual traders appear to be uninformed traders with distinct trade-related characteristics.

JEL classification: G20; G28; C11; C15; C35
Keywords: Endogeneity; Heterogeneity; Informed trader; Markov chain Monte Carlo; Private information; Simultaneous equations

1. Introduction

In the wake of the seminal work by Kyle (1985), Glosten and Milgrom (1985), and Easley and O'Hara (1987), there has developed a large body of research examining how informed traders impact asset prices and market liquidity (see O'Hara, 1995 for a summary).

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Unfortunately, the implications from this body of work are difficult to test, due to the simple fact that informed trading is unobservable. Consequently, empirical researchers have had to resort to inferring informed trading through indirect means, such as through trading profits (Fishman and Longstaff, 1992), through trade sizes (Barclay and Warner, 1993), through trade sizes and trader types (Chakravarty, 2001), and through the timing of trades (Lee et al., 1993).

In the current paper, we adopt a new empirical technique to investigate if dual traders are informed traders. Dual trading is an age-old custom in futures markets whereby some floor traders are allowed to trade both for themselves and for their customers. Our investigation is motivated by an ongoing Congressional debate on whether dual traders should enjoy such a privilege (see Chakravarty and Li, 2001) and the extant literature, both theoretical and empirical, that is silent on the specific question addressed here.[2] Underpinning the Congressional debate is the issue of whether these traders can (and do) take advantage of their privileged position of observing their customers' orders to make personal trading profits.

We employ a simple, yet powerful, test to investigate if dual traders are informed traders. In particular, we jointly examine a dual trader's own account trading decision and profitability by employing a simultaneous equations model with a binary endogenous variable—the decision of whether to trade on his own account—and a trading profit variable. In the own account trading equation, the error term captures the dual trader's (unobservable) private information. In the profit equation, the error term captures his abnormal profit. A significant correlation between the error term in the own account trading decision equation and the error term in the profit equation would indicate that the dual trader possesses (unobservable) private information that leads to abnormal profit. An important feature of our modeling framework is that we isolate the abnormal trading profit associated with a dual trader's personal trades from his overall trading profit and correlate the abnormal profit with the unobserved private information (if any) of the dual trader. In contrast, Chakravarty and Li (in press) examine if dual traders are informed traders by regressing their own account trades on variables capturing information (derived from observing their customers' orders), liquidity supply, and inventory control, while Fishman and Longstaff (1992) infer dual traders' information from the overall trading profit associated with their personal trades.

Our data are time series of audit trails at the Chicago Mercantile Exchange (CME) during the first half of 1992 compiled by the Commodity Futures Trading Commission (CFTC). The data provide information on trade time, price, quantity, trade direction (buyer or seller) and the trader's identification. They are used internally by the CFTC for regulation

[2] Specifically, the theoretical literature on dual trading, for example, starts with the basic assumption that dual traders are informed traders and then investigates the effects of their trading strategies (through piggybacking and/or front running) on market liquidity and the informativeness of prices (see, for example, Grossman, 1989; Roell, 1990; Fishman and Longstaff, 1992; Chakravarty, 1994; Sarkar, 1995). The empirical literature on dual trading can be broadly classified into three themes. The first theme focuses on the liquidity effects of various dual trading restrictions imposed on the futures markets (Smith and Whaley, 1994; Chang et al., 1994; Chang and Locke, 1996; Locke et al., 1999). The second theme of the empirical literature examines the microstructure of futures markets under competitive market making (Manaster and Mann, 1996; Ferguson and Mann, 2001). The third theme, represented by Chakravarty and Li (in press), examines the timing and determinants of own account trading by dual traders.