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Public information and uninformed trading: Implications for market liquidity and price efficiency ☆

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Abstract

We develop a rational expectations equilibrium model in which noise trading comes from discretionary liquidity traders. The equilibrium quantity of aggregate noise trading is endogenously determined by the population size of liquidity traders active in the financial market. By improving market liquidity, public information reduces the expected trading loss of liquidity traders and thus attracts more such traders to the market, which negatively affects information aggregation. Analyzing an alternative setting that models noise trading as coming from hedgers yields similar insights. In a setting with endogenous information, public information can harm information aggregation both through crowding out private information and through attracting noise trading.

JEL classification: D61; G14; G30; M41

Keywords: Discretionary liquidity trading; Market liquidity; Information aggregation; Information production; Hedging

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1. Introduction

Rational expectations equilibrium (REE) models have been the workbench for analyzing financial markets by providing a machinery of Hayek's (1945) idea that prices aggregate information dispersed among market participants. These models typically introduce "noise trading" or "liquidity trading" to prevent the market price from fully revealing private information and to circumvent the "no trade" problem (Milgrom and Stokey, 1982). The essential feature of noise trading is that it has no informational content; that is, in a statistical sense, it is independent of the fundamental value of the traded asset.[1] The theoretical literature has so far focused on studying the behavior of investors who trade on private information and it largely ignores how the quantity of noise trading is determined.[2]

In the modern financial market, much of uninformed trading is engaged by financial institutions. For example, fund managers need to rebalance their portfolios for non-informational reasons when receiving large inflows or redemptions from clients.[3] The resulting trading can be viewed as "discretionary liquidity trading," which has been studied in the microstructure literature (e.g., Admati and Pfleiderer, 1988; Foster and Viswanathan, 1990). Another example of uninformed trading is algorithmic trading, which has become increasingly dominant in the stock market. Skjeltorp et al. (2016) document that algorithmic trading originating from large institutional investors is likely to be uninformed. Uninformed trading may also result from hedging activities of financial institutions. For instance, investment banks may invest in commodity futures to hedge their issuance of commodity-linked notes (CLNs) whose payoffs are linked to the price of commodity futures. Henderson et al. (2015) provide evidence that futures investments of CLN issuers do not convey information about fundamentals but nonetheless significantly impact commodity futures prices.

What determines the size of noise trading in financial markets? What are the implications of this endogenous noise trading for market outcomes? In this paper, we provide theoretical models to answer these important questions. The baseline model in Section 3 generates uninformed trading using the notion of discretionary liquidity traders. These traders are uninformed and may experience future liquidity shocks. Anecdotal evidence suggests that transaction cost is an important factor in determining the behavior of discretionary liquidity traders.[4] Our mechanism of determining noise trading makes an effort to capture this feature.

Formally, we develop a model with one risky asset. Differentially privately informed speculators and uninformed discretionary noise traders exist. Speculators trade on their private information to maximize expected utility. Noise traders are "discretionary" in the sense that each chooses whether to participate in the market by optimally balancing the expected loss from trading against informed speculators versus a liquidity benefit of market participation. The expected

[1] Throughout the paper, we follow the literature and use the terms "noise trading"/"liquidity trading"/"uninformed trading" interchangeably. Similarly, we use "noise traders"/"liquidity traders" interchangeably to refer to those investors whose trading behavior generates the uninformed trading.

[2] For example, the classical studies by Grossman and Stiglitz (1980), Hellwig (1980), and Verrecchia (1982). More recent references include Kondor (2012), García and Urošević (2013), Kovalenkov and Vives (2014), and Cespa and Vives (2015), among many others.

[3] Da et al. (2015) find that pension fund companies in Chile often face redemption requests amounting to 10% of their domestic equity and 20% of their bond portfolios within a few days.

[4] For instance, "(m)inimizing trading costs is a priority for DFA's strategy and its managers spend much time working out ways to trade optimally," where DFA refers to Dimensional Fund Advisors, one of the top U.S. mutual fund companies (*The Wall Street Journal*, November 6, 2006, "The Dimensions of A Pioneering Strategy").