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Transaction costs and informational cascades in financial markets

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ABSTRACT

We study the effect of transaction costs (e.g., a trading fee or a transaction tax, like the Tobin tax) on the aggregation of private information in financial markets. We implement a financial market with sequential trading and transaction costs in the laboratory. According to theory, eventually all traders neglect their private information and abstain from trading (i.e., a no-trade informational cascade occurs). We find that, in the experiment, informational no-trade cascades occur when theory predicts they should (i.e., when the trade imbalance is sufficiently high). At the same time, the proportion of subjects irrationally trading against their private information is smaller than in a financial market without transaction costs. As a result, the overall efficiency of the market is not significantly affected by the presence of transaction costs.

1. Introduction

There is a long and widespread debate on the role of transaction costs in the functioning of financial markets. Such costs can be imputed to different reasons, such as brokerage commission fees, time involved in record keeping and securities transaction taxes. It has been argued that transaction costs can have negative effects on the process of price discovery. The presence of even very small costs makes rebalancing expensive. Therefore, valuable information can be held back from being incorporated into prices.

In recent years, such a debate has gained new strength, following the proposals by many policy makers around the world to introduce security transaction taxes (e.g., a Tobin tax),[1] especially in emerging markets. Opponents have stressed how these taxes can reduce the efficiency with which markets aggregate information dispersed among their participants. In contrast, proponents have argued that such taxes only reduce excessive trading and volatility, and can prevent the occurrence of financial crises.[2]

In this paper we will contribute to this debate by studying the effect of transaction costs in a laboratory financial market. We will focus, in particular, on the role of transaction costs in the process of information aggregation.

We will first present a theoretical model similar to that of Glosten and Milgrom (1985), in which traders trade an asset with a market maker. The market maker sets the prices at which traders can buy or sell. The prices are updated according to

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[1] In 1978, Tobin proposed that all major countries should introduce a tax on foreign-exchange transactions.
[2] For a review of this debate, see Habermeier and Kirilenko (2003) and the comment by Forbes (2003).

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the order flow, that is, to the sequence of trades. Traders can buy or sell one unit of the asset or abstain from trading. If they decide to trade, they have to pay a transaction cost.

We will show that the presence of transaction costs has a significant effect on the ability of the price to aggregate private information dispersed among market participants. Transaction costs cause "informational cascades:" situations in which all informed traders neglect private information and abstain from trading.[3] Such blockages of information can occur when the price is far away from the fundamental value of the asset. Therefore, transaction costs can cause long lasting misalignments between the price and the fundamental value of a security. Not only are informational cascades possible, but they also occur with probability one. Eventually, the trade cost overwhelms the importance of the informational advantage that the traders have on the market maker, and therefore informed agents prefer not to participate in the market, regardless of their private information.

These results contrast with those of Avery and Zemsky (1998), who show that informational cascades cannot occur in financial markets where trade is frictionless. In their work, agents always find it optimal to trade on the difference between their own information (the history of trades and the private signal) and the commonly available information (the history of trades only). For this reason, the price aggregates the information contained in the history of past trades correctly. Eventually, the price converges to the realized asset value. With transaction costs, in contrast, the convergence of the price to the fundamental value does not occur since trading stops after a long enough history of trades. With positive probability, no-trade cascades occur when the price is far from the fundamental value of the asset, even for a very small transaction cost.

To test the theory, we have run an experiment. A laboratory experiment is particularly fit to test the theory since in the laboratory we observe the private information that subjects receive and can study how they use it while trading. In our laboratory market, subjects receive private information on the value of a security and observe the history of past trades. Given these two pieces of information, they choose, sequentially, whether they want to sell, to buy or not to trade one unit of the asset at the price set by the market maker. By observing the way in which they use their private information, we directly detect the occurrence of cascades. The experimental results are in line with the theoretical model. Indeed, cascades form in the laboratory as the theory predicts (i.e., when the trade cost overwhelms the gain to trading).

Nevertheless, even if with trade costs cascades do arise, in the laboratory the ability of the price to aggregate private information is not significantly impaired. This happens because when transaction costs are present, there is a lower incidence of irrational behavior and, in particular, of trading against one's own private information. The higher level of rationality makes the price reflect private information more accurately. This explains why the overall impact of transaction costs on the market efficiency is very small.

Our theoretical analysis lends credibility to the arguments against the introduction of a security transaction tax (like a Tobin tax): it is true that financial frictions impair the ability of prices to aggregate private information by making informational cascades possible. The occurrence of cascades is confirmed by the laboratory experiment. As proponents of the tax have suggested, however, financial frictions also reduce the occurrence of irrational behavior, which improves the ability of the price to reflect subjects' private information. These two effects offset each other in the laboratory so that the transaction cost does not significantly alter the financial markets informational efficiency.

In the theoretical social learning literature, the impact of transaction costs in financial markets has been first discussed by Lee (1998), who studies a sequential trade mechanism in which traders are risk averse and receive signals of different precision. Traders can trade more than once with the market maker and can buy or sell different quantities (shares) of the asset. Transaction costs trigger cascades followed by informational avalanches in which previously hidden private information is suddenly revealed. Eventually, however, a complete stop of information occurs, which results in long-run misalignments of the price with respect to the fundamental.[4] In contrast to Lee, we study the effect of transaction costs in a standard market microstructure model à la Glosten and Milgrom. Our theoretical setup is particularly useful for our experimental analysis since it is easy to implement in the laboratory. The theoretical result on the occurrence of cascades in a Glosten and Milgrom model with transaction costs was also shown in independent work by Romano (2007).

There are only few experimental papers that have studied informational cascades in financial markets.[5] Cipriani and Guarino (2005a,b) and Drehmann et al. (2005) have tested Avery and Zemsky's model in the laboratory and have found that, as theory predicts, informational cascades rarely occur in a laboratory financial market in which traders trade for informational reasons only and there are no transaction costs. More recently, Cipriani and Guarino (in press) have tested the same model using financial markets professionals. Their results confirm the absence of informational cascades in a frictionless financial market. Cipriani and Guarino (in press) also test a model where, because of informational uncertainty, traders may find it optimal to ignore their private information and herd. They find that such a behavior occurs in the laboratory, but less than theoretically predicted.

[3] For a review of the literature on informational cascades, see Gale (1996), Hirshleifer and Teoh (2003), Chamley (2004), and Vives (2008).

[4] In Lee the complete stop of information arises because agents stop trading. Cipriani and Guarino (2008) show that a complete blockage of information can also arise when agents herd buy or herd sell, because of traders' heterogeneity (stemming from non-informational reasons to trade, such as liquidity or hedging reasons).

[5] While there are only two experiments on herding and cascades in financial markets, there is a much larger experimental literature testing the original herding models where the price is fixed. Among the others, see the seminal paper by Anderson and Holt (1997) and the papers by Çelen and Kariv (2004), Drehmann et al. (2007), Goeree et al. (2007), Huck and Oechssler (2000), Hung and Plott (2001), Kübler and Weizsäcker (2004) and Weizsäcker (2006).