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The effect of anonymity on price efficiency: Evidence from the removal of broker identities

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ABSTRACT

We show that broker identities are important for price formation. We use the removal of broker identities by the ASX on November 28th 2005 as a natural experiment and compare the information signal of broker identities before and after its removal. We find that broker identities have significant information content, which reduces after the market becomes anonymous. The reduction in the information content of broker identities is larger during periods of high adverse selection costs, such as during days with price-sensitive corporate announcements. Overall, whilst anonymity may provide various ancillary benefits, our evidence suggests that removing broker identities reduces the informativeness of order flow and thus the anonymous market can be costly for uninformed investors.

1. Introduction

This study examines the effect of anonymity on the price efficiency of stock markets, using the removal of broker identities by the Australian Securities Exchange (ASX) as a natural experiment. The provision of anonymity is an important consideration by exchanges around the world because it affects price formation and trading strategies of market participants (Comerton-Forde and Tang, 2009; Duong and Kalev, 2013; Foucault et al., 2007). Although a large literature postulates that transparency improves market quality (Glosten, 1999; Madhavan, 1996; Pagano and Roell, 1996), numerous financial exchanges around the world have moved to an anonymous trading system. For example, the Euronext Paris removed broker identity on April 23rd 2001, while the Tokyo Stock Exchange removed broker identity on June 30th 2003.

The ASX adopted a similar rule on November 28th 2005. From November 28th 2005, broker identities are not disclosed until three trading days later. The justification for creating anonymity is that the disclosure of broker identities in real time enables front-running activities, thus discouraging trading activities and eroding the incentives for information acquisition among traders. Ultimately, this reduces market liquidity as investors seek for execution outside of the limit order book (ASX, 2003).

Previous studies have explored the effects of moving to anonymous trading systems and documented improved liquidity and reduced order aggressiveness following this change in market design (Comerton-Forde et al., 2005; Comerton-Forde and Tang, 2009; Duong and Kalev, 2013; Foucault et al., 2007). In contrast, Linnainmaa and Saar (2012) argue that anonymity is costly to uninformed investors because it reduces information efficiency. In particular, they show that the broker identity signals valuable information about the type of investors that initiate trades. As institutional investors are more informed than retail investors on average (Chakravarty, 2001), this leads to stronger price reaction to trades initiated by institutional brokers, relative to retail brokers. As a

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result, broker identities have a significant effect on market price. A yet untested implication of Linnainmaa and Saar (2012)'s findings is that anonymity slows down the price adjustment process. This is important, as we show in this paper, it means that anonymity generates costs for uninformed traders that would otherwise not exist in a transparent market where informed institutional trades are absorbed into price more efficiently.

We extend this literature by examining the effect of anonymity on price efficiency using an experiment where the ASX stopped disclosing the broker identities in real time on November 28th 2005. Specifically, we investigate whether the market price reacts more to trades initiated by brokers associated with institutional investors, relative to those associated with individual investors, before or after the removal of broker identities. We focus on the differential price impact between institutional and individual brokers-initiated trades because previous studies show that institutional investors are more informed than individual investors (Anand et al., 2005; Chakravarty, 2001; Linnainmaa and Saar, 2012). If broker identities help the market detect informed trades, we expect institutional-broker-initiated trades to have higher price impact than retail-broker-initiated trades. When the market moves to anonymity and broker identities are hidden, the ability to detect the type of traders behind each trade is reduced. This consequently leads to slower price discovery.

We collect a sample of trades on Standard and Poor's/ASX 200 (S&P/ASX 200) stocks from May 2nd 2005 to May 31st 2006. For each trade in our sample, we collect the identities of both the selling and the buying brokers, and identify which broker initiates the trade. Following Comerton-Forde and Tang (2009) and Duong and Kalev (2013), we exclude two trading weeks before and after the anonymity event (November 28th 2005) to avoid short-term effects associated with the event and confounding effects due to less active trading around the turn of the year. We define the period prior to November 28th 2005 as the transparent market, where market participants can observe broker identities in real time. The period after November 28th 2005 is considered the anonymous market, as the broker identity for each trade is not available until three trading days after. We further collect market information to control for market conditions surrounding the trade. Using broker identities, we group brokers into institutional brokers and retail brokers based on the description of their primary clients, following the methods described in Fong et al. (2014) and Tian et al. (2015). We then estimate the difference in the price impacts between institutional-broker-initiated trades and retail-broker-initiated trades in the transparent market and in the anonymous market.

Our empirical analysis reveals that in the transparent market, the information content of institutional-broker-initiated trades is larger relative to the information content of retail-broker-initiated trades. This finding is consistent with Linnainmaa and Saar (2012) and highlights that broker identities are important for price discovery.[1] We further analyse price discovery in the anonymous market, where broker identities are not disclosed in real time (after November 28th 2005). We document that the information content of institutional broker identities becomes less pronounced after its removal, and that price adjusts more slowly to informed trades. In the transparent market, about 50% of the one-hour price reaction occurs within the first five minutes after an institutional trade, whereas in the anonymous market, only 20% of the price reaction occurs in the first five minutes.[2] Additionally, price adjustment is consistently slower in the anonymous market within the first hour following an informed trade. These results suggest that the removal of broker identities harms the price discovery process because broker identities provide valuable information about the type of investors that initiate the trades.[3]

We conduct further analyses to support our main findings. We compare the price impacts of retail and institutional brokers during days when price-sensitive announcements are made. We argue that with information arrival, adverse selection costs are high because the risk of trading with informed traders is high. As a result, broker identities become particularly important on announcement days because this helps market participants detect informed traders. We analyse the permanent price impact of the broker type on information days in the transparent and the anonymous markets separately. We find that in the transparent market, the price impact of institutional broker-initiated trades is consistently larger than the permanent price impact of retail broker-initiated trades, and that this effect is particularly strong during announcement days. In contrast, in the anonymous market, we find that during announcement days, the permanent price impact of institutional broker-initiated trades is either smaller than, or not significantly different from, the permanent price impact of retail broker-initiated trades within the first thirty minutes after the trade. The permanent price impact of institutional broker-initiated trades is positive and significant only for the sixty-minute interval. This indicates that on announcement days in the anonymous market, there is a delay before the market is able detect the information profile of traders.

We further explore the effect of anonymity on the information content of broker identities across different levels of the bid-ask spreads. Copeland and Galai (1983), Easley and O'Hara (1987) and Glosten and Harris (1988) argue that market makers widen the spread when there is a risk of trading against informed traders. This finding shows that larger bid-ask spreads are associated with

[1] Similar to Linnainmaa and Saar (2012), we do not speculate the type of information the informed trader possesses. We simply maintain that the broker identity information is price-sensitive because it reveals the type of investors behind the trade.

[2] Our results indicate that broker identities have a significant permanent price impact even in the anonymous market. While this seems counterintuitive, we argue that investors are able to detect the broker behind the trade, despite the broker identifier code being hidden. For instance, investors might be able to detect informed trading from order size. This is consistent with the stealth trading hypothesis studied in Barclay and Warner (1993) and Chakravarty (2001). Similarly, investors can infer whether the trade is informed if it comes from a sequence of same-side orders (Frino, Johnstone and Zheng, 2005; Linnainmaa and Saar, 2012). We further discuss this finding in Section 4.3.

[3] Our findings imply that the removal of broker identities increases adverse selection, which might lead to lower liquidity. This seems contradictory to prior literature that documents an improvement in liquidity following the removal of broker identities [see, for example, Comerton-Forde et al., 2005]. However, we argue that it is not necessarily the case While some studies find an improvement in liquidity following anonymity, others find the opposite (Reiss and Werner, 2005; Seppi, 1990; Theissen, 2003). These findings thus show that anonymity could have various effects on liquidity. Moreover, we focus on the speed of price adjustment, rather than the aggregate level of price informativeness. We argue that anonymity results in slow price adjustment, harming uninformed investors in the process. We further elaborate this point in Section 4.3.