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Assessing the information content of short-selling metrics using daily disclosures

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ABSTRACT

As a consequence of the 2008 financial crisis, the Australian regulator mandated daily reporting and disclosure of both short flow and short interest at an individual stock level. This provides a unique opportunity to study the nature and source of information embedded in each metric. Our empirical findings are consistent with short sellers being heterogeneous with respect to their information. Short flow is strongly related to recent returns and buy-order imbalance, and both anticipates and reacts to price-relevant announcements. In contrast, short interest is related to the mispricing of firm fundamentals. The distinct differences in the nature of information embedded in the two metrics provide an economic rationale for both the unique ability of each metric to predict returns and the future horizons over which the information is relevant.

1. Introduction

At the height of the 2008 financial crisis, concerns about the impact of short selling on market quality led many countries to impose temporary bans on shorting.[1] In the aftermath, the activities of short sellers have been heavily scrutinized by market regulators, researchers and the media. Mandatory disclosure regimes of varying forms have subsequently been implemented in many markets.

The rationale for disclosure is premised on the belief that there is information content in short selling.[2] Diamond and Verrecchia (1987) demonstrate that, in the presence of short sale constraints, short sellers are predominantly informed traders. As such, high levels of short interest generally reflect bad news/sentiment. Indeed, the empirical literature documents strong evidence that short-selling activity conveys information about future returns. Short flow (i.e., the ratio of short transaction volume to total trading volume) is inversely related to future stock performance (Boehmer et al., 2008; Diether et al., 2009; Engelberg et al., 2012; Chang et al., 2014). Similarly, short interest (i.e., the ratio of aggregate short positions to the number of shares outstanding) negatively predicts future returns (Senchack and Starks, 1993; Desai et al., 2002; Asquith et al., 2005; Ackert and Athanassakos, 2005; Au et al., 2009).

While many studies focus on the negative returns of heavily shorted stocks, Boehmer et al. (2010) conjecture that the relative *absence* of shorting conveys positive information. Consistent with prior literature, their heavily-shorted portfolio underperforms over the subsequent month. However, lightly-shorted stocks generate significant positive abnormal returns. Boehmer et al. (2010) conclude that short sellers are adept not only at identifying overvalued stocks to short, but also undervalued stocks to avoid. Similarly, using UK daily stock lending data to proxy for short interest, Au et al. (2009) also find that lightly-shorted stocks generate positive risk-adjusted returns.

Given the weight of evidence that short-selling activity is informative for future returns, researchers are beginning to explore the

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[1] Primarily, these bans targeted financial stocks (US, UK, Germany, Canada, France, Switzerland). However, some countries went as far as restricting short selling on *all* equities (Australia, Italy, Japan, Singapore, Korea, Netherlands, Taiwan). For studies on the impact of the 2008 ban on financial markets, see Boehmer et al. (2013) and Beber and Pagano (2013).

[2] For example, the International Organization of Securities Commissions' Task Force on Short Selling states that the international disclosure initiative will enhance investor confidence by ensuring that markets are fair, efficient and transparent (IOSCO, 2009). Similarly, the Australian Securities and Investments Commission (ASIC) argues that short selling disclosure allows investors to better understand share-price movements and the overall bearish sentiment towards a stock, thereby informing decision making and assisting pricing efficiency (ASIC, 2010).

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precise nature and source of short sellers' information. An obvious starting point is the notion that short-selling activity reflects private information about upcoming value-relevant news. Short flow increases around firm-specific events such as earnings announcements (Boehmer et al., 2012; Christophe et al., 2004; Berkman and McKenzie, 2012), analyst downgrades (Boehmer et al., 2012; Christophe et al., 2010), seasoned equity offerings (Henry and Koski, 2010), private placements (Berkman et al., 2014), public revelation of financial misconduct (Karpoff and Lou,2010) and the disclosure of company insiders' trading (Chakrabarty and Shkiko, 2013).

Moving beyond news events, the price impact of which is likely to be swift, some short sellers trade on information that is relevant over longer horizons. Dechow et al. (2001, p. 78) depict short sellers as sophisticated investors who incur large transaction costs to identify and trade overpriced securities. They document that short sellers position themselves in stocks with poor fundamentals, with an expectation of profiting from the eventual reversion to fair valuations. In a similar vein, Curtis and Fargher (2014) argue that short sellers utilize financial statement analysis to identify overpriced securities. In addition to fundamental ratios (book-to-market, earnings yield, value-to-price), they also demonstrate that short sellers seemingly take valuation signals from accruals and asset growth. Using 11 accounting-based fundamental variables, Drake et al. (2011) find that short sellers are highly informed about the likely implications of fundamental information for future returns.

Clearly, the nature and sources of information that potentially motivate short trading are diverse. As such, short sellers are likely to be heterogeneous with respect to their information and investment horizon. At present, however, relatively little is known about the *unique* information content of alternate short-selling metrics. For example, prior research has not investigated whether the fundamental information embedded in short interest also manifests in short flow, or if information events and technical trading captured in short flow are also reflected in short interest. To the extent that short flow and short interest reflect similar information, there are important regulatory and disclosure implications. If, however, the source and nature of information embedded within each metric differs, there are obvious implications for pricing efficiency and transparency, as well as for the likely future horizons over which the information content of each metric is relevant.

For a number of reasons, empirically identifying the unique information content of each short-selling metric and sources thereof is challenging. Unavoidably, much of the prior work has been constrained by the availability of a single metric (either short flow *or* short interest). Further, even in jurisdictions where both metrics are available, there is often a mismatch between the frequency with which they are collated and reported.[3] To this end, the current paper benefits significantly from changes to the short-selling disclosure regime implemented in Australia in the aftermath of the 2008 financial crisis. Since mid-2010, short selling in Australian equities has been subject to a mandatory disclosure regime that encompasses *both* short flow and short interest. Data at the individual stock level are reported to regulators on a daily basis. Further, there is little delay in this information reaching the public domain. Short transaction volumes are publicly disclosed the following day whilst short positions are disclosed the day following settlement (i.e., $T+4$ after the trade). As such, while Australia's daily reporting and disclosure regime falls short of real time, it is arguably the most comprehensive and timely reporting of short sales data in the world.

Aided by this unique regulatory environment, this paper makes two important contributions. First, we study the nature and source of information that is reflected in each short-selling metric. Drawing on the existing literature, we conjecture that short flow (a transactional measure) is more likely to capture short-term technical trading and/or value-relevant news surrounding company announcements. In contrast, short interest (a positional measure) is likely to embed information about firm fundamentals and associated mispricing that will be corrected over horizons longer than the immediate. Australia's dual reporting regime facilitates an exploration of the unique information in short flow and short interest. In particular, the high-frequency (i.e., daily) reporting of short-selling activity greatly enhances our ability to study the nature and source of information around news events.

The second contribution is to assess the relative importance of the information content of short flow and short interest by way of their ability to predict cross-sectional differences in returns. To the extent that each metric embeds unique information, short flow and short interest should have independent ability to predict future returns. Further, it follows that the horizon over which the predictive ability exists will likely reflect the nature and source of information within each metric. Our data provides a level playing field on which to compare the two metrics of short-selling activity. In much the same way that our daily sample is integral to identifying the nature of information within each metric, it is also essential to studying the predictive ability when the relevance of the information content is likely to be short lived.

The key findings of the paper are summarized as follows. There is clear evidence that alternate short-selling metrics reflect different facets of the short sellers' information set. A stock's short flow is strongly related to its recent returns and current buy-order imbalance, consistent with short sellers engaging in short-term contrarian trading and voluntarily providing liquidity during periods of temporary buying pressure. While these findings mirror US results of Diether et al. (2009), we provide new evidence that this information is unique to short flow – the same information does not manifest in change in short interest (an alternate transactional measure that nets out short covering). Similarly, only short flow data appears to both anticipate imminent price-relevant announcements and react to news, increasing following bad earnings news and decreasing after good non-earnings news. One caveat is warranted – while the influence of news on short flow is statistically strong, the economic significance is modest at best.

While there is little evidence that it conveys information about news, short interest appears to embed information about firm fundamentals and associated mispricing. Short interest (or a lack thereof) reflects the aggregate sentiment of short sellers over the longer-term prospects of a stock. We document that short sellers target overpriced stocks, with high levels of short interest disproportionately concentrated in overpriced stocks. Further, there is an unduly low level of high shorts amongst under-priced stocks, suggesting that short sellers are adept at avoiding them. There is no evidence that short flow is related to mispricing.

By identifying the differential information captured by alternate short-selling metrics, we are able to provide better context to understand both the unique ability of short flow and short interest to predict future returns and the horizons over which their information content is relevant. The importance of information captured by a short metric is assessed with reference to the cross-sectional difference in returns to portfolios of stocks sorted on the metric. The results show that future portfolio returns are negatively associated with both short flow and short interest. For short flow, the return differential between extreme quintiles is in

[3] For example, Boehmer et al. (2008) compare the relative informativeness of short flow (estimated from proprietary intraday data aggregated over the most-recent five days) and short interest (based on changes in publicly-released short interest data from the previous month). Similarly, Blau et al. (2011) examine the information content of short flow (sourced from a combination of Reg SHO and NASDAQ proprietary data, sampled daily and aggregated to monthly frequency) and short interest (sampled monthly from Compustat).