



The efficacy of regulatory intervention: Evidence from the distribution of informed option trading



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ABSTRACT

A substantive body of equity-market academic research documents an extensive range of costs arising from the SEC's October 2000 adoption of strictures on selective disclosure and insider trading; suggesting an unusual outcome, specifically, an increase in informed trading. We investigate the efficacy of the SEC's regulations by examining informed trading in an attractive setting for exploiting private information; the options market. Using data on the S&P 1500 industrial firms, our analysis indicates that about 38% of firms exhibited symptoms of informed option trading prior to regulatory intervention. After regulatory intervention, we observe that only 19% of firms show symptoms of informed trading. In additional testing of ADR firms – explicitly exempt from complying with Reg FD, we find no evidence of a change in informed option trading from pre- to post-regulation; suggesting that the SEC's strictures on US firms led to a significant reduction in informed option trading. Notably, our proxies for large shareholder and financial analyst access are associated with the largest decreases in informed option trading. In developing a unique measure of informed trading based on option market data, we provide evidence on the efficacy of security regulation in limiting informed trading.

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1. Introduction

In implementing their package of rules on selective disclosure and insider trading (Reg FD, Rule 10b5-1 and Rule 10b5-2) in October of 2000, the Securities and Exchange Commission (SEC) ostensibly intended to restrict the flow of private information and thereby limit informed trading. The SEC noted in the announcement and discussion surrounding this regulatory intervention that many firms revealed important, non-public information, such as advance notice of quarterly earnings results, to large shareholders and financial analysts prior to disclosing the

information to the public.⁴ The SEC's regulatory package was aimed at reducing the information advantage that these market professionals enjoyed over other capital market participants (Duarte et al., 2008). Overall, the underlying justification for the SEC's regulatory package centered on curbing information flow to pseudo insiders as this material, non-public information facilitated informed trading.

Yet, investment professionals countered by suggesting that the SEC's intervention would limit disclosures to all stakeholders, potentially leading to greater informed trading (Baily et al., 2003). Several empirical studies suggest this disclosure regulation has limited or even unintended consequences on outside shareholders (Heflin et al., 2003). Bushee et al. (2004) for instance, observe that the SEC's adoption of selective disclosure and insider trading rules negatively influenced managers' decisions to host

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⁴ Final Rule – Selective Disclosure and Insider Trading: The Securities and Exchange Commission is adopting new rules to address three issues: the selective disclosure by issuers of material nonpublic information; when insider trading liability arises in connection with a trader's "use" or "knowing possession" of material nonpublic information; and when the breach of a family or other non-business relationship may give rise to liability under the misappropriation theory of insider trading. The rules are designed to promote the full and fair disclosure of information by issuers, and to clarify and enhance existing prohibitions against insider trading. Source: <http://www.sec.gov/rules/final/33-7881.htm>.

conference calls and increased stock price volatility. Several empirical studies also examine the regulation's effect on analysts' forecast properties and find results suggesting disruptions in information flow and greater informed trading (e.g., Gintschela and Markov, 2004). Mohanram and Sunder (2006) observe that by limiting firms' information flow, analysts have less ability to provide detailed firm coverage and robust earnings forecasts, thereby creating asymmetric information problems amongst investors.

Academic research yields mixed findings on Reg FD's efficacy in affecting information disclosure. Initial research examining the relation between Reg FD and stock price bid–ask spreads indicates an increase in information disclosure after regulatory adoption and thus, the potential for less informed trading (Eleswarapu et al., 2004). Subsequent research however, indicates that after the implementation of these rules, firms experienced an increase in the cost of capital; suggesting that regulatory intervention impaired information flow to outside investors and increased informed trading (Gomes et al., 2006; Duarte et al., 2008). This body of research also documents increases in the probability of informed trading (PIN) and decreases in information disclosure after passage of the trading strictures (Straser, 2002; Jorion et al., 2005; Duarte et al., 2008). Recent studies moreover, suggest that the SEC's regulatory package not only failed to limit informed trading but also subjected market-makers to greater asymmetric information risks. Sidhu et al. (2008) specifically, report a 36% increase in the adverse selection component of equity bid–ask spreads after regulatory intervention. In aggregate, a substantive body of research using stock-market data indicates that the array of security regulations adopted by the SEC limited net disclosures to analysts and investors, potentially leading to a perverse result – an increase in informed trading. A question thus arises on whether the regulatory package achieved its intended goal of limiting trades based on material, non-public information.

We investigate the efficacy of the SEC's intervention by examining informed trading in stock-option markets before and after implementation of the regulatory package. Options on firms' stock prices provide an attractive environment to exploit profitable, non-public information due to options' leverage effects and short-time horizons (Black, 1975). Easley et al. (1998) observes that lower trading costs and higher leverage effects in the option markets relative to equity markets provide informed traders with an especially attractive setting to exploit their information. Empirically, Aragon and Martin (2007) document that informed traders prefer to exploit their private information in the options market rather than the equity market. Prior research moreover, indicates that option prices incorporate information on firms' future earnings and merger and acquisition activity (Cao et al., 2005). Amin and Lee (1997) for instance, find that option prices foreshadow future earnings shocks, providing evidence consistent with the notion that informed investors use options to trade on material, non-public information. Option markets arguably provide a compelling and robust environment to examine the effect of regulatory changes on informed trading. Using the return predictability component of the option volatility smirk to capture informed trading, our analysis gauges the effectiveness of regulatory intervention by comparing informed option trading prior to- and after-enactment of the SEC' strictures on selective disclosure and insider trading.

Regulators and investors potentially hold two different perspectives in assessing the efficacy of regulations in limiting informed trading. Regulators likely exhibit concern about the entire distribution of informed trading and focus on the law's success in reducing the frequency or prevalence of informed trading. Investors however, arguably exhibit concern as to the extent to which the regulation influenced the depth or intensity of informed trading and thus affected traders' ability to forecast future stock returns. In a similar vein, Card and Payne (2002) indicate that education offi-

cial show interest in the distribution of student tests scores as well as the mean test score, i.e., the portion of students passing an exam and the students' average, passing grade. For our analysis, we examine the prevalence of firms experiencing informed trading (portion of students passing) and the intensity of informed trading (students' average exam score) before and after enactment of the SEC's regulatory package. We then investigate whether the distribution of informed option trading prior to the regulation's passage stochastically dominates the distribution of informed option trading after regulatory passage (Levy, 1992). Stochastic dominance provides a powerful, nonparametric procedure to examine alternative outcomes and permits testing beyond just the change in the distribution's mean from pre- to post-regulatory intervention (Jarrow, 1986; Kopa and Post, 2009).

Our measure of informed trading uses the shape of the option volatility smirk to predict future equity returns (Xing et al., 2010). To measure the portion of future equity returns captured by informed option trading, we run an augmented Fama–French four factor model that includes a 1-day lag of the option smirk. The smirk coefficient from the Fama–French model then forms the basis of our proxy of informed trading. Our study compares informed option trading *within* firm, *across* firms, and *across the entire distribution* during pre- and post-regulation to gauge the effectiveness of the regulation in limiting informed trading.

In our first hypothesis, we argue that the SEC's regulations eliminated or limited selective information disclosure amongst the firm's stakeholders, thereby affecting the distributional characteristics of informed option trading. Our second hypothesis, the *pseudo insider hypothesis*, then focuses on two groups highlighted by the SEC as primary beneficiaries in receiving advanced disclosures of material information; influential shareholders and security analysts. The regulatory package prohibits corporate officials from selectively disclosing information to security analysts and influential shareholders, thereby leveling the information environment across different investor classes. We posit that these regulations exerted a greater effect in limiting informed trading in firms with large shareholders than firms with diffuse ownership structures (no large shareholders). Beyond influencing information flow to influential shareholders, the SEC also intended for the regulations to limit the flow of material, private information to security analysts. Thus, we argue that firms providing analysts with substantial access to private information experience a larger decrease in informed trading than firms providing analysts with little access to private information.

Examining the S&P 1500 industrial firms and designating the period from 1997 through 1999 as pre-Reg FD and 2001 to 2003 as post-Reg FD, our results indicate a significant and marked decrease in informed option trading after regulatory enactment. Prior to the regulations' passage, we observe that about 38% of firms exhibited symptoms of informed option trading. After regulation, the results indicate that only about 19% of firms exhibited symptoms of informed option trading. The analysis further indicates that the intensity or depth of informed option trading substantially decreased from pre- to post-regulation. On average, we find over a 50.4% decrease in the intensity of informed option trading after regulatory enactment.⁵

Characterizing the distribution of informed option trading (pre- and post-regulatory passage) as cumulative distribution functions (CDF), we examine whether pre-regulation informed trading stochastically dominates post-regulation informed trading. The McFadden test (McFadden, 1989) results indicate that pre-regula-

⁵ Examining *only* those firms experiencing informed trading during the pre-regulatory period, the results indicate that regulation was particularly effective in reducing informed option trading. In particular, we observe about a 78.3% decrease in the prevalence and a 72.8% decrease in the intensity of informed option trading for symptomatic firms after the regulations' enactment.

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