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How does divergence of opinions affect the relative trading activity and information content in option and stock prior to takeover announcement?

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ABSTRACT

This paper examines whether the options/stock trading volume ratio (O/S) is higher when investors' opinions are more diverse with respect to the value of acquirer during pre-takeover announcement period and explores how divergence of opinions affects the predictive power of O/S on subsequent stock prices. We find that the coefficients of proxies for diversity of opinion are significantly positive, suggesting that more disagreements tend to have higher volumes of option trading relative to stock. Less predictive powers of O/S on subsequent stock returns are associated with larger divergence of opinion, implying that O/S contains less information about subsequent stock price movements when the divergence of opinions of acquirer firm is higher.

1. Introduction

Over the past few decades, a considerable number of studies have been conducted on the relative merits of trading in option and stock to explore where the informed trader should trade. Nevertheless, only few attempts have been made to date to examine the relative trading volume in derivatives and their underlying assets. Roll, Schwartz, and Subrahmanyam (2010) explore the determinants of the options/stock trading volume ratio (O/S). They suggest that O/S might be driven by informed trades. Choy and Wei (2012) find that around earnings announcements, stocks associated with greater dispersion of opinions tend to have a higher O/S. Moreover, option trading is mostly driven by differences of opinion instead of information asymmetry. Since the extent of informed trading during a pre-takeover announcement period should be higher than such trading during pre-earning announcement period[1], the impact of dispersion of opinions should be lower than that of information asymmetry during a pre-takeover announcement period. Therefore, we explore whether more disagreements still tend to result in higher O/S during a pre-takeover announcement period[2].

Although a great deal of effort has been made to study the relationship between divergence of opinions and stock market price (Miller, 1977; Chen, Hong, & Stein, 2002; Diether, Malloy, & Scherbina, 2002), little is known about the effect of divergence of opinions on a particular type of corporate event. For example, Berkman, Dimitrov, Jain, Koch, and Tice (2009) expect earnings announcements to reduce differences of opinions among investors; consequently, these announcements should reduce overvaluations. Moeller, Schlingemann, and Stulz (2007) document that, in mergers and acquisitions, as divergence of opinions increases related to an acquirer's equity value, acquirer return on equity offers decreases. Chatterjee, John, & Yan (2012) indicate that total takeover premium

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[1] Cao, Chen, and Griffin (2005) document that unlike preplanned earning announcements, takeover announcements are not scheduled; even the announcement's pending is not known by the public. Abnormal pre-takeover announcement trading could be initiated primarily by informed traders. The extent of informed trading during a pre-takeover announcement period should be higher than such trading during pre-earning announcement period.

[2] In our paper, there could be two kinds of disagreement, which are the disagreement about the likelihood of a takeover announcement and the disagreement about the firm value. Since takeover announcement's pending is not known by the public, the latter type of disagreement should dominate the former one.

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is higher when investors have a greater diversity of opinions on the target's value. Unlike prior studies' focus on the stock price of acquirer or target, we pay attention to trading volume. Further, the past studies on diversity of opinions for a takeover have only been conducted on stock market. The impact of diversity of opinions on the linkage between option and stock markets during a takeover has never been discussed[3]. Because both higher volumes of options and stocks should be associated with a higher diversity of opinions, the relative trading activity in options and stocks of the acquirer is uncertain. That is, we use the option/stock trading volume ratio proposed by Roll et al. (2010) to explore whether O/S is higher when investors have greater diversity of opinions on the value of acquirer[4].

Johnson and So (2012) find that O/S negatively predicts the returns of options' underlying stocks over a one-week horizon because informed traders use options more frequently for bad news[5]. Instead, Chan, Li, and Lin (2015) make a regression of acquirer absolute return on unsigned O/S because M&A event could be good news or bad news. They show that higher O/S predicts higher acquirer absolute announcement return. In particular, we explore how divergence of opinions on equity value of acquirer affects the predictive power of O/S on subsequent stock prices during pre-takeover announcement period.

Moreover, although Miller's overvaluation[6] occurs when both dispersion of opinions and short-sale constraints are relatively high, the above empirical tests have typically focused on only dispersion of opinions. These uni-dimensional approaches might reduce the power of the magnitude of the measured overvaluation. Therefore, the extant literature contains some inconclusive empirical results. Boehme, Danielsen, and Sorescu (2006) examine the two Miller dimensions using proxies for both differences in marginal costs of short selling and dispersion of opinions. They find robust evidence of Miller-style overpricing and acquire point-estimates of ex-post abnormal returns, which are significantly more negative than previously reported. Therefore, in this paper, short-sale constraints are also concerned to increase the power of the linkage between option and stock markets in takeover[7].

We find that the coefficients of the proxy of diversity of opinions are significantly positive, indicating that more disagreements tend to have higher option trading volume relative to stock trading during the pre-takeover announcement period. The predictive powers of the O/S on subsequent stock returns in higher divergence of opinions are weaker, implying that the options volume contains less information about subsequent stock price movements. In addition, the information effects of options and stocks volume from both dispersion of opinions and short-sale constraints are not stronger than those only from dispersion of opinions.

This paper contributes to the literature on divergence of opinions in two important aspects. First, the related studies focus on the effect of the divergence of opinions on stock prices in the stock market. For example, Moeller et al. (2007) explore the relation between divergence of opinions of the acquirer and its abnormal return, and Chatterjee et al. (2012) examine the effect of divergence of opinions of the target on takeover premium. Further, we extend the research to the options market. That is, we investigate whether the divergence of opinions of the acquirer could influence the decisions of informed traders to trade in the stock or option market during the pre-takeover announcement period. We believe our attempt is the first to focus on the options market in a takeover in the literature on divergence of opinions. Second, Moeller et al. (2007) and Chatterjee et al. (2012) focus on the effect of divergence of opinions on abnormal stock return around takeover announcements, whereas we are concerned with the influence on relative volume of option and stock and the information content of volume of option and stock on future stock prices.

Our paper also contributes to the literature on O/S. The related studies focus on the effect of O/S on stock's announcement abnormal return around earning and takeover announcements. Around earning announcements, Roll et al. (2010) document that post-announcement absolute returns are positively related to pre-announcement O/S. Johnson and So (2012) find that firms in the lowest decile of the O/S outperform the highest decile. Around takeover announcement, Shafer (2012) finds that the deviations in dollar O/S have some predictive power of a target firm's abnormal returns on the day prior to the acquisition announcement. Chan et al. (2015) show that higher O/S predicts higher acquirer absolute announcement return. Ge et al. (2014) find that the signed O/S measures can predict announcement returns for both earnings announcements and unscheduled corporate events. Further, we explore whether the divergence of opinions have the impact of predictive power of O/S on announcement return.

The remainder of this paper is organized as follows. Section 2 develops testable hypotheses. Section 3 describes the data and defines the variables. Section 4 presents the regression results and discussions, and Section 5 tests the robustness checks. Section 6 provides our conclusion and suggestion.

2. Hypotheses

According to Chordia, Huh, and Subrahmanyam (2007), dispersion in analysts' opinions is positively related to stock trading volume. Choy and Wei (2012) show that option trading is primarily driven by differences in opinions, indicating that greater disagreements lead to higher option trading volume. Specifically, around earning announcement, they find that more disagreements tend to create higher option trading volume relative to the stock trading volume. In addition, option trading is mostly driven by differences of opinion instead of information asymmetry. Because the extent of informed trading during a pre-takeover announcement period should be higher than that during pre-earning announcement period, the impact of dispersion of opinions should be lower than that of information asymmetry during a pre-takeover announcement period. Moreover, during the pre-announcement takeover period, informed traders prefer to trade options, and then option contains more information (Hu, 2014). Since takeover event might be good (or bad) news for investors, informed traders would long (short) call options or short (long) put options. In each case, O/S should increase. Therefore, we explore whether more disagreements still

[3] Cao and Ou-Yang (2009) find that, during normal period, disagreements over the mean of the current- and next-period public information lead to trading in stocks during the current period but have no effect on options trading.

[4] Elkamhi, Lee, and Yao (2011) also use the ratio of options' open interest to stock trading volume (OI/S) and find that OI/S is a conditional measure of informed option trading.

[5] Ge, Lin, and Pearson (2014) use signed option volume to examine which components of option volume predict returns. They find no evidence that trades related to synthetic short positions in the underlying stocks contain more information than trades related to synthetic long positions. They argue that the role of options in providing leverage is the most important reason why options trading predict stock returns.

[6] Miller (1977) argues that, when investors with heterogeneous beliefs are subject to short-sales constraints, a stock's price reflects the valuations of optimists, but do not reflect the valuations of pessimists, because the pessimists simply sit out of the market. Conditional on a fixed stock float, the greater divergence of opinions in a stock price's valuation by optimists and pessimists is associated with the higher price of the stock in equilibrium.

[7] Lin, Liu, and Driessen (2013) find that informed traders choose to use the options market particularly because of short-sale constraints. Hao, Lee, and Piqueira (2013) show that in general short sales of the underlying stock contain more information than put options. Chen, Chen, and Chou (2014) argue that short-sale constraints relaxation allows traders to switch part of their trading demand to the stock market.