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Takeover vulnerability and the behavior of short-term stock returns ☆

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ABSTRACT

This paper proposes and tests the hypothesis that takeover vulnerability contributes to short-term price reversal by motivating investors to trade speculatively and also by making investors demand immediacy in their trades. That is, takeover vulnerability is hypothesized to amplify two channels of short-term price reversal, namely, overreaction and price concession. Using several different measures of takeover vulnerability, we find that takeover vulnerability is positively related to price reversal at daily frequencies. We also find that their positive relation is more pronounced when the stock is illiquid or when it is costly to arbitrage, a finding that is consistent with the notion that the observed price reversal is driven by the earlier price concession or overreaction. While unable to determine the exact relative importance between the two channels, we conduct further analysis showing that each channel plays an independent role. Finally, we find no relation between takeover vulnerability and price reversal at the portfolio level, which means that the price reversal observed in individual stock returns is driven by a firm-specific component.

1. Introduction

The openness to the market for corporate control is unique in a firm's governance structure, as it can directly affect the behavior of outside investors as well as that of corporate managers. Specifically, besides disciplining corporate managers by exposing them to takeover threats, a firm's openness to takeovers–more precisely, the prospect of large takeover premiums–can incentivize outside investors to collect and trade on private information about the company as a potential takeover target (e.g., Cao et al., 2005; Ferreira and Laux, 2007; Jarrell and Poulsen, 1989). In this paper, we study this unique aspect of takeover vulnerability by examining its effects on the way investors trade stocks and the way stock prices behave.

To derive testable implications, we begin by noting that takeover premiums start accruing considerably *before* public announcements. Such a sizable price run-up prior to the announcement means that private information about future takeover targets is fast capitalized into the stock price and, as a consequence, private information on future takeover targets depreciates

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accordingly fast. In other words, the duration of takeover-related private information is particularly short.[1] From this notion, we derive two implications for investors' trading behavior. One is that when an investor receives a private signal that a company might become a takeover target, the investor will want to react quickly before the signal reaches other investors and loses its value as private information. However, such a desire for a quick response to new information may lead the investor to make a mistake, namely, an overreaction.[2] The other implication, which is just a different angle at the same phenomenon, is that once the investor decides to trade on his private signal, he will want to execute his trades as quickly as possible. However, such a demand for immediacy in trades might require a concession in price, because risk-averse traders would otherwise be unwilling to be on the other side of the trade (Campbell et al., 1993; Grossman and Miller, 1988; Stoll, 1978).

We note that the two implications of takeover vulnerability for investor trading behavior–i.e., the overreaction and the demand for immediacy–precisely correspond to two channels of short-term price reversal (e.g., Atkins and Dyl, 1990; Bremer and Sweeney, 1991; Brown et al., 1988; Cox and Peterson, 1994; Jegadeesh and Titman, 1995; Kaniel et al., 2008). It is well established in the literature that a reversal in stock price over a short horizon can occur for the following two reasons. One is because investors initially made a mistake in the form of an overreaction and the price is reversed subsequently as a correction of the earlier mispricing. Alternatively, it is because a price concession was made initially and, since it is not caused by a change in the stock's economic fundamentals, a reversal follows subsequently.[3] The main argument of this paper is thus that a firm's takeover vulnerability affects its stock price by amplifying the two channels of short-term price reversal.

To develop our idea further into testable empirical predictions, we consider the conditions for an overreaction or a price concession arising in the first place. It is well established that a stock's mispricing arises in a non-trivial way when the stock's fundamental value is difficult to determine and at the same time it is costly to trade against (i.e., arbitrage) mispricing (e.g., Baker and Wurgler, 2006; Shleifer, 2000). Thus, our argument about the overreaction-induced reversal can be tested by examining whether takeover vulnerability contributes to price reversal especially when the stock is difficult to arbitrage. A similar approach can be taken to testing the price-concession channel. Since the reversal via this channel is more likely when the stock is illiquid, we can see whether the relation between a firm's takeover vulnerability and the short-term price reversal of its stock is more pronounced when the stock is illiquid.

To test these predictions, we need to measure the degree of short-term price reversal on one hand and the extent of takeover vulnerability on the other hand. As a measure of price reversal, we use the variance ratio. Specifically, we calculate the ratios of a 1-day return variance to a 5-, 10-, 15-, or 20-day return variance, in which the denominator is scaled by 5, 10, 15, or 20. Thus, the reversal of a day's return over the next 5, 10, 15, or 20 days will be revealed through a higher-than-one variance ratio. As Cochrane (2005; p. 411–412) shows, the variance ratio is the sum of individual autocorrelations at different lags. Hence, the variance ratio helps enhance the power of the test when a reversal occurs over several days.[4] We focus on the reversal of a *day*'s return, because given the huge investor interest in future takeover targets, one day is deemed sufficiently long enough for takeover news to be "fully" recognized and for an overreaction–if any–to arise.[5]

To measure takeover vulnerability, we take several different approaches. First, we follow Cremers and Nair (2005) by focusing on three core anti-takeover provisions compiled by the Investor Responsibility Research Center (IRRC) database, namely, classified (staggered) boards, blank check preferred stock, and restrictions on shareholders on calling special meetings or acting through written consent. We construct a measure by counting the occurrences of those three provisions within a firm and then deducting it from three, so that our measure increases with takeover vulnerability. We refer to this measure as *ToVul*.

For the period from 1990 to 2005, we cross-sectionally associate the average *ToVul* of a firm with its variance ratios that are estimated over the same period as the one during which *ToVul* is averaged. We find that *ToVul* is positively related to each of the four variance ratios, meaning that takeover-vulnerable stocks experience a greater daily price reversal. Furthermore, we find that the positive relation is more pronounced among small stocks and among the stocks with a wide bid–ask spread. This finding is consistent with our hypothesis that takeover vulnerability contributes to short-term price reversal especially when the stock is costly to arbitrage or when it is illiquid.

To construct other measures of takeover vulnerability, we extend to a broader set of anti-takeover provisions as in Gompers et al. (2003) or in Bebchuk et al. (2009). As those authors note, the resulting measures are more of an overall governance measure rather than a measure of takeover vulnerability. That is, they are a "noisy" measure of takeover vulnerability compared to *ToVul*. Thus, to the extent that the results with *ToVul* are driven by takeover vulnerability, these noisy measures will produce a weaker result. Indeed, we find this to be the case.

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[1] Jarrell and Poulsen (1989) show that the price run-up is caused by the anticipation and speculation on potential target targets. See also Cao et al. (2005). Part of this run-up might be attributable to insider trading (e.g., Meulbroek, 1992). Still, our point remains valid, because the insider trading moves the stock price in such a way that the value of unused private information shrinks quickly.

[2] There is an alternative scenario. Specifically, being aware of the possibility that the private signal is in fact non-information, the investor might wait for further verification. Under this scenario, an underreaction would be the likely mistake. Once the stock price starts moving in the direction of the signal, however, the investor will have an even stronger incentive to trade on his signal, which re-opens the scope for an overreaction (e.g., Hong and Stein, 1999). Eventually, it is an open empirical question whether there is any mistake and, if so, which of the two mistakes dominates. We return to this issue later in the introduction where we discuss our choice of data frequency and other empirical designs.

[3] In this setup, the bid–ask bounce of Roll (1984) is subsumed to the price concession channel. We detail this issue in Section 2.1.

[4] Cochrane (2005) is also quoted as saying that "[I]f there are many small negative autocorrelations which bring returns back slowly after a shock, these autocorrelation might be individually insignificant… [T]heir sum might be economically and statistically significant…" (p. 411).

[5] We are aware that one day might turn out to be either too short (meaning that an overreaction has yet to be materialized) or too long (meaning that any overreaction has already been corrected). Eventually, this is an empirical question that can be answered only by data. Moreover, as a robustness check, we employ the 1st-order autocorrelation in weekly returns to gauge the reversal of a *week*'s return over the next week.