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Short-sellers, fundamental analysis, and stock returns[☆]

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Abstract

Firms with low ratios of fundamentals (such as earning and book values) to market values are known to have systematically lower future stock returns. We document that short-sellers position themselves in the stock of such firms, and then cover their positions as the ratios mean-revert. We also show that short-sellers refine their trading strategies to minimize transactions costs and maximize their investment returns. Our evidence is consistent with short-sellers using information in these ratios to take positions in stocks with lower expected future returns. © 2001 Elsevier Science S.A. All rights reserved.

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1. Introduction

Conventional wisdom characterizes short-sellers as sophisticated investors who incur relatively large transactions costs attempting to short-sell and subsequently repurchase temporarily overpriced securities.¹ Asquith and Meulbroek (1996) provide evidence that short-sellers, as a group, successfully identify securities that subsequently underperform the market. In this paper, we identify the characteristics of the securities targeted by short-sellers. Specifically, we examine whether short-sellers target stocks of firms that are priced high relative to fundamentals such as earnings and book values.

A large body of evidence demonstrates that ratios of measures of fundamental value to market value systematically predict future stock returns. These ratios compare estimates of “intrinsic” values based on accounting data to observed market prices. They range from simple ratios such as earnings-to-price and book-to-market (e.g., Fama and French, 1995; Lakonishok et al., 1994) to ratios based on more sophisticated valuation models such as Ohlson (1995) (e.g., Frankel and Lee, 1998; Dechow et al., 1999). Given the well-documented predictive ability of these ratios with respect to future stock returns, they provide a natural starting point for investigating the trading strategies of short-sellers.

We document a strong relation between the trading strategies of short-sellers and ratios of fundamentals to market prices. Our tests indicate that short-sellers target securities that have low fundamental-to-price ratios and then they unwind their positions as these ratios revert to normal levels. We also show that short-sellers refine their trading strategies in three ways in order to maximize their investment returns. First, short-sellers avoid securities for which the transactions costs of short-selling are high. Second, short-sellers supplement their trading strategies by using information beyond that in fundamental-to-price ratios that has predictive ability with respect to future returns. Third, we show that short-sellers avoid shorting securities with low fundamental-to-price ratios when the low ratios are attributable to temporarily low fundamentals. In other words, short-sellers act as if they are able to discriminate between low ratios that are due to temporarily low fundamentals and low ratios that are attributable to temporarily high prices.

A straightforward interpretation of our results is that low fundamental-to-price ratios are associated with temporary overpricing that is actively exploited by short-sellers. This interpretation is consistent with the Lakonishok et al. (1994) hypothesis that “naïve” investors tend to be overoptimistic about the future prospects of stocks with low fundamental-to-price ratios. Under this interpretation, our evidence suggests that short-sellers are sophisticated

¹ See, for example, *Business Week*, August 5, 1996, pp. 63–68, *Fortune*, November 9, 1998 p. 272, and *Forbes*, December 28, 1998, pp. 101–103.

investors who play an important role in keeping the price of stocks in line with fundamentals. An alternative interpretation of our results is that low fundamental-to-price ratios are associated with unique risk characteristics. This interpretation is consistent with the Fama and French (1992) hypothesis that stocks with low fundamental-to-price ratios have low sensitivity to the “book-to-market” risk factor. Under this interpretation, short-sellers achieve superior returns by short-selling low-risk stocks. These superior returns are compensation for the increased exposure to the book-to-market risk factor. In an attempt to discriminate between these competing interpretations, we conducted a telephone survey of major global short-selling hedge funds. The fund managers all endorsed the first interpretation provided above, i.e., they short-sell stocks they perceive to be overpriced. However, it is also possible that short-sellers inadvertently load up on the risk factor conjectured by the second interpretation above.

The paper proceeds in four sections. The next section develops our predictions. Section 3 describes our research design, Section 4 presents the results, and Section 5 concludes.

2. Empirical predictions

We begin in Section 2.1 by describing the institutional features of short-selling and identifying the objectives, risks, and costs of short-selling. Section 2.2 then describes several established techniques for predicting future stock returns by comparing ratios of fundamental measures of value to market prices. These sections provide the underpinnings for our empirical predictions, which are presented in Section 2.3. In Section 2.4 we discuss the possible confounding effects of any unidentified risk factors on the interpretation of our results.

2.1. Institutional details on short-selling

A short sale is a sale of a stock that one does not already own, but has borrowed from a brokerage house, a large institutional investor, or another broker-dealer. The short-seller establishes the position by selling the borrowed stock, and closes the position by buying the stock back at a later time, using the purchased shares to extinguish the initial loan of the stock. By selling short, an investor can profit from a decrease in the stock price. The risk-return profile for a short position is very different from that of a long position. A short-seller’s maximum gain is the sale price of the stock (if the stock price falls to zero), while the loss is potentially unlimited (if the stock price rises). Because of the high risk associated with short-selling, and because of its putative potential for manipulating stock prices, short-selling is heavily regulated in U.S. stock

markets and is not allowed in many foreign stock markets. Many institutional investors are prohibited from short-selling, or restricted in the size of their short positions relative to the overall size of their portfolios. Asquith and Meulbroek (1996) provide an extensive review of the institutional aspects of short-selling. Here we provide only a brief summary of the process in the United States.

Regulation in the United States has developed from beliefs that short-sellers can cause stock prices to spiral downward. The ensuing regulations act to increase the cost of short-selling. The U.S. Securities and Exchange Commission requires short-sellers to sell only on a “plus tick” or a “zero plus tick,” that is, when the stock price has increased. The proceeds from a short sale are not available to the short-seller. Instead, the proceeds are escrowed as collateral for the owner of the borrowed shares. Typically, the short-seller receives interest on the proceeds, but the rate received (the “rebate”) is below the market rate. The difference is the compensation to the lender of the stock. Thus, short-sellers cannot directly use the proceeds from short sales to reinvest or to hedge their short position. Regulation T, set by the Federal Reserve, requires short-sellers of stocks to deposit additional collateral of 50% of the market value of the shorted shares. The short-seller can use either long positions in other securities or interest-bearing Treasury securities to meet this additional margin requirement, mitigating the cost of maintaining this additional collateral (any dividends or interest earned on securities in the collateral margin account accrue to the short-seller). If the price of the shorted stock rises, increasing the liability of the short-seller, additional collateral funds are generally required. The tax treatment of short positions contributes to the high cost of short-selling. All profits from a short sale are taxed at the short-term capital gains rate, no matter how long the short position is open. Finally, the short-seller is required to reimburse the stock lender for any dividends or other distributions paid to the shareholders of the shorted stock while the short position is open. Because the ex-dividend stock price of the shorted stock is generally higher than the pre-dividend stock price less the amount of the dividend (e.g., Frank and Jagannathan, 1998), dividend reimbursement represents a real cost to the short-seller (in addition to inconvenience and transactions costs).

The standard stock-lending practice is that the loan must be repaid on demand. This practice exposes short-sellers to the risk of being “squeezed.” A short squeeze occurs when the lender of the borrowed shares wants to sell the stock. If the short-seller is unable to find an alternative lender, the short-seller must repurchase the shares in the open market to repay the loan and close the position. To avoid this risk, a short-seller can borrow on a term basis for an additional fee, but most short-sellers seem to prefer the risk of a squeeze to the cost of a term loan, and term loans are rare. To help short-sellers assess the probability of a squeeze, the broker will sometimes reveal the identity of the

lender of the shorted stock. Generally, a short squeeze is less likely for more liquid securities, such as large market-capitalization stocks with high institutional ownership, since it is easier for brokers to find alternative lenders of such stocks in the event that the original lender demands the return of the borrowed shares.²

Short-selling is therefore riskier and more expensive than establishing a long position. Because short sales are more costly than long transactions, Diamond and Verrechia (1987) suggest that short-sellers will not trade unless they expect the price to fall enough to compensate them for the additional costs and risks of shorting. Short-sellers, they propose, are therefore more likely to be better informed than are investors with long positions. A short sale is the most direct way for an investor to bet that a stock's price will decrease.³ Of course, short sales occur for a myriad of reasons, only one of which is a belief by the short-seller that the stock is overvalued relative to its fundamentals. In a merger situation, investors often simultaneously go long in the target firm's stock and short in the acquiring firm's stock. In "pairs trading" investors hedge themselves by shorting a security whose return is highly correlated with the return of another security they have purchased (e.g., selling Dell short and purchasing Gateway). Another reason for short-selling is to arbitrage a price differential between the stock and debt convertible into the stock. These other reasons for short-selling are not motivated by the expectation of a price decline. Thus, to the extent that short-selling is attributable to these other activities, they add noise to our empirical tests.

Early research on short interests by Figlewski (1981), Woolridge and Dickinson (1994), Brent, Morse, and Stice (1990), and Figlewski and Webb (1993) fails to document a strong relation between short interest and excess returns. However, Asquith and Meulbroek point out that the power of the tests in these studies is weak, since their sample selections are not based on the magnitude of the short interests. As documented by Asquith and Meulbroek, many firms have very small short positions (less than 0.5%). These small short positions are likely to represent hedge positions, rather than a systematic attempt to exploit perceived overpricing. By focusing on a sample of firm-years with large short interests (e.g., firm-years with short positions greater than 2.5% of shares outstanding), Asquith and Meulbroek document a strong and

² An extreme example of a short squeeze is the case of Amazon.com. In June 1998, the number of shorted Amazon shares neared its entire float. The firm then announced a stock split, and the stock price rose significantly, with demand coming from both long investors *and* short-sellers who were squeezed due to the lack of shares to borrow. Fears of a short squeeze have been cited as an important reason why many short-sellers avoid heavily shorting "overpriced" Internet stocks (see St. Louis Post-Dispatch, July 19, 1998, p. E3).

³ Asquith and Meulbroek (1996) point out that although the option market may seem a less costly way to achieve the same goal, many hedge-fund managers and other practitioners state that the option market is even more expensive, particularly for hard-to-borrow stocks.

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