

# SHORT SALES: Bearish OR Bullish?

Is the eventual buy-back that accompanies short selling a sign of positive market sentiment?

BY LUCY ACKERT AND GEORGE ATHANASSAKOS

**T**raders with negative information about a firm's prospects can directly profit from an anticipated price decline by short selling the firm's stock. However, it is argued, this action might be interpreted as a bullish signal to the market, since short sellers have to purchase the stock in the future to cover their position. Ultimately, higher demand for the stock as short sellers close their positions will result in upward pressure on the price. This argument, commonly put forth in the business press, is the focus of this study.<sup>1</sup>

We investigate the relationship between short interest, defined as the ratio of the number of shares short to trading volume, and excess returns for Canadian stocks. We find strong evidence that short sales are bearish. Using semi-monthly data for 1991-1994 and 1998-1999, we find that increases in short interest are contemporaneously associated with negative abnormal

returns. Furthermore, the negative news persists. Excess returns for stocks with high short interest remain abnormally negative six months after short positions are taken. While we find that there is some short covering for the lowest short-interest quartiles, we conclude that, on average, there is no positive effect on excess returns due to the covering of short positions. Thus, our results fail to support the hypothesis that increased demand subsequent to short sales leads to significant upward price pressure. Instead, our results are consistent with the belief that short sellers are informed traders who take positions based on negative information regarding deteriorating stock fundamentals.

Information regarding short interest positions is collected and reported on a semi-monthly basis in Canada. The Toronto Stock Exchange requires brokers to file short sale reports on all short positions taken over a 15-day period within two business days after the 15th

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# “Short sellers are informed market participants who move prices.”

and month-end. One day later, the exchange makes these reports available to members and subscribers, and the information is reported with a lag of approximately one week in national outlets such as the *National Post/Financial Post* and the *Globe and Mail/Report on Business*.

The regulation governing short sales in Canada is detailed and extensive. The Toronto Stock Exchange requires short sales be made on a zero-tick, meaning that a stock can be short sold at a price equal to or above the price for the most recent trade on the exchange. This rule increases the execution cost of short selling because traders cannot short when the price is falling. In addition, short sellers often do not receive interest on the short sale proceeds and are required to post margin equal to 50% of the market value of the stock.<sup>2</sup> The margin rules tie up funds, limiting participation in other situations and potential revenue. Regulation constrains short selling because it increases the cost.

## Who Shorts if Short Selling is Costly?

If short selling becomes more costly, only those who expect to reap the greatest benefit will short sell. Relatively uninformed traders will be less likely to short sell and only traders with strong negative information will be willing to bear the cost of short selling. According to Diamond and Verrecchia (1987), rational market participants incorporate this information into their trading decisions. Increases in short interest are instantaneously bad news, and short sellers are informed market participants who move prices.

Several early studies examined the relationship between short interest and excess returns but a strong relationship was not consistently identified (Figlewski

[1981], Brent, Morse, and Stice [1990], and Woolridge and Dickinson [1994]).<sup>3</sup> More recent research suggests that short sellers are able to successfully identify poorly performing stocks (Asquith and Meulbroek [1996], Dechow, Hutton, Meulbroek, and Sloan [2001], and Desai, Ramesh, Thiagarajan, and Balachandran [2002]).<sup>4</sup> Using intraday data, Aitken, Frino, McCorry, and Swan (1998) confirm that short sales are instantaneously bad news for Australian stocks.

A recent paper by Ackert and Athanassakos (2004) investigates the relationship between short interest and excess returns for Canadian stocks. As in this paper, short interest is defined as the ratio of the number of shares short to semi-monthly trading volume because volume reflects information in the market.<sup>5</sup> Their results strongly support the assertion that a negative contemporaneous relationship exists between short sales and excess returns. Ackert and Athanassakos further document that excess returns are less negative for large firms because the supply of shortable shares for such stocks is less constrained. Excess returns are also less negative for stocks with associated options and convertible bonds. Finally, stocks interlisted in the U.S. and Canada experience more negative returns because informed traders move transactions to the Canadian market to exploit lower execution costs.

## Is Short Selling Bullish or Bearish Over the Longer Run?

To examine whether short interest is good news or bad news for a stock, we use a sample of semi-monthly Canadian data. Our sample includes short positions as reported by the Toronto Stock Exchange (TSX). Data from January 1991 through December 1994 are obtained in hard copy, with more recent data from January 1998 through December 1999 provided by the TSX electronically.<sup>6</sup> The earlier data include information when the number of shares short or the absolute net change in shares short exceeds 5,000, whereas the more recent data include all firms with positive shares shorted or non-zero net change in shares shorted during the semi-monthly time period.<sup>7</sup> Additional data, including beta, are from the Canadian Financial Markets Research Centre (CFMRC).

Using the CFMRC database, we compute two excess

return series. First, we use a market-adjusted returns model and calculate the excess return ( $ER^{MM}$ ) as the difference between the return on each common stock and the return on the value-weighted CFMRC universe stock index during each semi-monthly period. Second, we calculate excess returns based on the Capital Asset Pricing Model ( $ER^{CAPM}$ ). In applying the CAPM, we use Canada's Treasury long-term bond yield to measure the risk-free interest rate and the value-weighted CFMRC universe stock index as the market portfolio. The bond yield and value-weighted index data are from the CFMRC.<sup>8</sup> In total, our sample includes 72,021 observations for 1,789 firms.

As Ackert and Athanassakos (2004) report, the number of shares sold short in Canada has steadily increased over time. From 1991 to 1999, the number of shares short has increased by a factor of nearly four. In our analysis, we divide shorted stocks into quartiles based on the magnitude of short interest as follows: we rank all stocks in the sample each year by short interest from low to high and then divide the ranked firms into four groups of equal size. We repeat this for each sample year and then group all data into four quartiles from low to high. Membership in a group changes each year because short interest changes from year to year.

Table I reports median short interest and excess

returns for sample firms by short interest quartile.<sup>9</sup> The table reports excess returns for two time periods: the contemporaneous semi-monthly time period and the subsequent six-month time period. The contemporaneous return is the excess return for the time period matched to the reported short interest for the corresponding semi-monthly time period. The return for the subsequent six-month time period is the cumulative excess return for the six months after the short interest information is tabulated. Excess returns are based on a market-adjusted returns model ( $ER^{MM}$ ) and the Capital Asset Pricing Model ( $ER^{CAPM}$ ). The final column reports a  $\chi^2$  test of the null hypothesis of no difference across quartiles.

Importantly, excess returns decline as short interest increases, whether measured using a market-adjusted returns model ( $ER^{MM}$ ) or the Capital Asset Pricing Model ( $ER^{CAPM}$ ). Brown-Mood nonparametric  $\chi^2$  tests, reported in the final column of Table I, indicate that both the median contemporaneous and subsequent six-month excess returns are significantly different across quartiles using both returns measures at  $p < 0.0001$ .<sup>10</sup> Thus, short sales are bad news to the market both when they occur and well after, particularly for firms with a high level of short interest. For these firms, sophisticated investors short sell based on negative information that is persistent.

**EXCESS RETURNS FOR SAMPLE FIRMS BY SHORT INTEREST QUARTILE**

**TABLE 1**

Variable	Short Interest Quartile				$\chi^2$ test
	Q1 (low)	Q2	Q3	Q4 (high)	
Short Interest	0.0049	0.0315	0.1435	0.9547	45,562.0**
Contemporaneous $ER^{MM}$	-0.0045	-0.0053	-0.0085	-0.0111	64.6**
Contemporaneous $ER^{CAPM}$	-0.0038	-0.0043	-0.0071	-0.0100	53.9**
Subsequent six-month $ER^{MM}$	0.0021	-0.0009	-0.0055	-0.0100	1,191.1**
Subsequent six-month $ER^{CAPM}$	0.0041	0.0016	-0.0053	-0.0100	131.4**

\*, \*\* indicates significance at the 5%, 1% level

Data are available for January 1991 through December 1994 and January 1998 through December 1999. Data is semi-monthly at the 15th and end of each month. The median values are reported by short interest quartiles where short interest is defined as the ratio of the number of shares short to the semi-monthly trading volume. Short interest data is from the Toronto Stock Exchange. The table reports excess returns for the contemporaneous semi-monthly time period as well as the subsequent six-month time period. Excess returns are based on a market-adjusted returns model ( $ER^{MM}$ ) and the Capital Asset Pricing Model ( $ER^{CAPM}$ ). The final column reports a  $\chi^2$  test of the null hypothesis of no differences across quartiles.

There does seem to be some short covering for the lowest short interest quartiles. Using the market model ( $ER^{MM}$ ), subsequent six-month excess returns are positive for the lowest quartile of short-sold stocks, while using the CAPM ( $ER^{CAPM}$ ), subsequent six-month excess returns are positive for the two lowest quartiles. These findings are consistent with an upward price pressure as short sellers close positions. However, our overall analysis shows that, on average, there is no positive effect on excess returns due to the covering of short positions.

## Conclusion

The results strongly indicate that stocks that are sold short perform poorly in Canada. We find no evidence that the covering of short positions leads to higher prices; in fact, poor performance persists in the future. Although this might appear to be consistent with market inefficiency, such a conclusion cannot be drawn because of the significant cost of selling short. Constraints on short sales limit the ability of traders to use information. These results indicate that regulators are advised to reconsider strict regulation of the practice of selling short. Lowering the cost of short selling by relaxing constraints on this activity will result in more efficient market pricing. Short sales promote market prices that reflect relevant information. ■

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## Endnotes

- For example, the following was reported in the *Toronto Star*: "Another reason a high short interest ratio may be seen as a bullish indicator is that all those shares that are sold short must be bought at some point as short sellers cover their positions. So the demand potential for those stocks is greater, which could buoy prices" (Toole [1994]).
- See *The Rules of the Toronto Stock Exchange* for more information on short sales restrictions.
- These studies did not sample firms based on the level of short interest. Some used random samples of firms, and others used data reported in the media that included only a subset of short sold stocks. If the universe of firms with short interest is not analyzed, a study will lack statistical power or omit firms with large levels of short interest.
- Additional insight into the behavior of short sellers is provided by Arnold, Butler, Crack, and Zhang (2003), Boehme, Danielson, and Sorescu (2002), Bris, Goetzmann, and Zhu (2002), and Evans, Geczy, Musto, and Reed (2003).
- Following Ackert and Athanassakos (2004), short interest is

defined in relation to volume because volume represents actual trading. Though the number of shares outstanding is sometimes used to define measures of short interest, it may not be informative. Shares outstanding may not reflect the actual float of a stock, especially in Canada. See Ackert and Athanassakos (2004) for further motivation of the short interest measure.

- The data does not span the 1990s because the acquisition of the earlier data required extremely time-consuming hand collection.
- Very small short sales are excluded to keep the task of hand collecting the data manageable.
- In general, the results reported subsequently are similar if we use an equally weighted CFMRC index, a value-weighted CFMRC index, or the TSX 300 value-weighted index.
- We report medians, rather than means, because the distributions are highly skewed.
- Because the distributions are highly skewed, we use the Brown-Mood test, an approximate  $\chi^2$  test and that does not rely on normality.

## References

- Ackert, Lucy F., and George Athanassakos, 2004, "Short interest and common stock returns: Evidence from the Canadian market," *Journal of Banking and Finance*, forthcoming.
- Aitken, Michael J., Alex Frino, Michael S. McCorry, and Peter L. Swan, 1998, "Short sales are almost instantaneously bad news: Evidence from the Australian Stock Exchange," *Journal of Finance*, 53(6), 2205-2223.
- Arnold, Tom, Alexander W. Butler, Timothy Falcon Crack, and Yan Zhang, 2003, "The information content of short interest: A natural experiment," *Journal of Business*, forthcoming.
- Asquith, Paul, and Lisa Meulbroek, 1996, "An empirical investigation of short interest," working paper, Harvard Business School, Harvard University.
- Boehme, Rodney D., Bartley R. Danielson, and Sorin M. Sorescu, 2002, "Short-sale constraints and overvaluation," working paper, DePaul University.
- Brent, Averil, Dale Morse, and E. Kay Stice, 1990, "Short interest: Explanations and tests," *Journal of Financial and Quantitative Analysis*, 25(2), 273-289.
- Bris, Arturo, William N. Goetzmann, and Ning Zhu, 2002, "Efficiency and the bear: Short sales and markets around the world," working paper, Yale School of Management.
- Dechow, Patricia M., Amy P. Hutton, Lisa Meulbroek, and Richard G. Sloan, 2001, "Short-sellers, fundamental analysis, and stock returns," *Journal of Financial Economics*, 62, 77-106.
- Desai, Hemang, K. Ramesh, S. Ramu Thiagarajan, and Bala V. Balachandran, 2002, "An investigation of the informational role of short interest in the Nasdaq market," *Journal of Finance*, 57(5), 2263-2287.
- Diamond, Douglas W., and Robert E. Verrecchia, 1987, "Constraints on short-selling and asset price adjustment to private information," *Journal of Financial Economics*, 18(2), 277-311.
- Evans, Richard B., Christopher C. Geczy, David K. Musto, and Adam V. Reed, 2003, "Failure is an option: Impediments to short selling and options prices," working paper, The Wharton School, University of Pennsylvania.
- Figlewski, Stephen, 1981, "The informational effects of restrictions on short sales: Some empirical evidence," *Journal of Financial and Quantitative Analysis*, 16(4), 463-476.
- Toole, David, 1994, "Have the shorts got it right this summer?" *Toronto Star*, July 24, D3.
- Woolridge, J. Randall, and Amy Dickinson, 1994, "Short selling and common stock prices," *Financial Analysts Journal*, 20-28.