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WHOSE SHORT SALES ARE INFORMED? INSTITUTIONS VS. INDIVIDUALS¹

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Abstract

This paper examines the information content of short sales by institutions and individuals in the Taiwan stock market. Different from NYSE and other main stock markets with rare shorting by individuals, individuals like to short stocks on the Taiwan Stock Exchange. This provides an opportunity to investigate whether institutions or individuals are informed short sellers. The empirical results indicate that institutions and individuals take more heavy short positions in stocks with lower fundamental values. Institutional short selling is positively associated with institutional holdings, but individual short selling is negatively related to institutional holdings. Moreover, heavy short selling results in negative abnormal return significantly, and there is no difference of abnormal return between institutional and individual short selling. Finally, the finding is still robust during the financial tsunami. Thus, in the Taiwan stock market, institutional and individual short sellers are both informed.

Keywords: short selling; short interest; institutional traders; individual traders; Taiwan Stock Exchange

JEL Classification: G14, G15

I. Introduction

Short sellers establish the positions by selling the borrowed stocks and close the position by buying the stocks back later. A large body of evidence demonstrates that short sellers have value-relevant information and their trading helps correct

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overvaluation. (e.g., Asquith and Meulbroek, 1996; Asquith *et al.*, 2005; Boehmer *et al.*, 2008; Diether *et al.*, 2009). Furthermore, previous research presents that firms with smaller fundamental values have lower future stock returns (e.g., Fama and French, 1992; Lakonishok *et al.*, 1994; Sloan, 1996). Dechow *et al.* (2001) therefore suggest that short sellers could use information in fundamental values to take positions in stocks with lower future returns. However, prior studies focus mainly on the analyses of information content in institutional short selling. In this paper, we ask whether the short sales of individuals or institutions are informed.

This paper contributes to the existing literature in the following two ways. First, this paper examines whether individuals take short positions in stocks with low fundamental values. On the NYSE and other main stock markets around the world, most of short sellers are institutional traders. Boehmer *et al.* (2008) provide evidence that shorting by individual traders on the NYSE is fairly rare and they account for 1% to 2% of overall shorting volume.⁵ However, the Taiwan Stock Exchange (TWSE) allows both individual and institutional traders to short stocks, and individual short selling is very popular on the TWSE. Previous research indicates that individual traders are typically viewed as uninformed traders (e.g., Shleifer and Summers, 1990; Lee *et al.*, 1991; Kumar and Lee, 2006; Foucault *et al.*, 2011). Since Dechow *et al.* (2001) suggest that low fundamental-to-price ratios are related to temporary overpricing that is actively exploited by short sellers, this paper attempts to analyze the relation between short selling by individuals and fundamental values of firms.

Second, this paper investigates which individual or institutional short sellers are better informed. Previous studies pay more attention on whether institutional short sellers are informed. Diamond and Verrechia (1987) propose that traders with short positions are more likely to be better informed than traders with long positions. Asquith and Meulbroek (1996) indicate that short sellers successfully identify stocks that subsequently underperform the market. Christophe *et al.* (2004) find that short sellers are informed traders since they anticipate a negative earnings surprise and a corresponding decline in stock price. Only Boehmer *et al.* (2008) provide evidence regarding the information content of short sales by individuals. Boehmer *et al.* (2008) present that individual short selling is completely uninformed. Based on the evidence of Boehmer *et al.* (2008), heavy shorting by individuals does not seem to be informative about future returns. Since the short selling of individuals on the TWSE is very popular, this paper tends to identify whether individual short sellers are better informed than institutional short sellers.

The empirical results indicate that individuals and institutions take more heavy short positions in stocks with lower fundamental values. Institutional short selling is positively associated with institutional holdings, but individual short selling is negatively related to institutional holdings. Moreover, heavy short selling results in negative abnormal return significantly, and there is no difference of abnormal return between short selling of individuals and institutions. Finally, the finding is still robust during the financial tsunami. Thus, institutional and individual short sellers are well informed on the TWSE.

⁵ Barber and Odean (2008) also present that only 0.29% of positions of individual traders are short positions.

The remainder of this paper is organized as follows: Section 2 describes the data and methodology used in this study; Section 3 presents the empirical results; and Section 4 concludes the paper.

II. Data and Methodology

In order to analyze whether the short sales of individuals or institutions are informed, this paper measures four ratios of fundamental-to-price at the end of last fiscal year: E/P, D/P, CF/P, and B/M.⁶ E/P is calculated as earnings per share divided by stock price. D/P is calculated as dividends per share divided by stock price. CF/P is calculated as cash flow per share divided by stock price. B/M is calculated as book value per share divided by stock price. Moreover, short interest is the percent of outstanding shares shorted, and we measure short interest three months after the end of the last fiscal year. According to Dechow *et al.* (2001), this setting provides reasonable assurance that the financial statement information has been available to short sellers. Finally, we accumulate one-year stock return starting from three months after the end of the last fiscal year, and then measure abnormal returns by adjusting each stock return by the return of the Taiwan weighted stock index (TWSI) over the same time.

All the data are obtained from the Taiwan Economic Journal (TEJ) database, which consists of the following information: financial statement, institutional holdings, short interest, and stock returns. Given the limitation of the short interest data, the sample covers all firms listed on the TWSE in the years 2006-2012.

III. Empirical Results

III.1. Fundamental values and short selling

Table 1 provides evidence on the relation between four fundamental-to-price ratios and abnormal returns.⁷ Firm-year observations are assigned to four quartiles (Low, 2, 3, and High) based on the relative magnitude of each ratio. The ranking procedure is carried out for each ratio and each calendar year separately. We then pool the observations across calendar years such that quartile 1 (Low) contains the lowest values of each ratio and quartile 4 (High) contains the highest values of each ratio. Panel A of Table 1 reports abnormal returns for four quartiles on E/P. The abnormal returns vary from -0.031 in quartile 1 to 0.001 in quartile 4 and the lowest abnormal returns are located at the lowest E/P (quartile 1). Similar results are shown in other panels of Table 1. Panel B of Table 1 reports that the lowest abnormal returns, -0.094, occur at the lowest D/P quartile. Panel C of Table 1 reports that the lowest abnormal returns, -0.077, occur at the lowest CF/P quartile. Panel D of Table 1 reports that the lowest abnormal returns, -0.131, occur at the lowest B/M quartile. Overall, each fundamental-to-price ratio has predictive ability with respect to the one-year-ahead abnormal return.

⁶ The four ratios of fundamental value to price is commonly used in prior studies, such as Fama and French (1992), Lakonishok *et al.* (1994), Sloan (1996), Dechow *et al.* (2001), etc.

⁷ Similar to prior research, we exclude observations when the numerator is negative or zero in four fundamental-to-price ratios.

Table 1
The relation between four fundamental-to-price ratios and abnormal returns

	Quartile			
	Low	2	3	High
Panel A: E/P and related abnormal returns				
E/P	0.027*** (58.32)	0.061*** (222.62)	0.087*** (296.66)	0.151*** (77.43)
AR	-0.031** (-2.55)	-0.069*** (-5.72)	-0.021* (-1.89)	0.001 (0.10)
Panel B: D/P and related abnormal returns				
D/P	0.014*** (65.18)	0.033*** (181.86)	0.053*** (205.83)	0.107*** (62.04)
AR	-0.094*** (-7.11)	-0.048*** (-3.95)	-0.001 (-0.09)	0.050*** (4.49)
Panel C: CF/P and related abnormal returns				
CF/P	0.028*** (58.96)	0.072*** (161.61)	0.121*** (180.05)	0.331*** (34.83)
AR	-0.077*** (-6.35)	-0.053*** (-4.53)	0.000 (0.03)	0.047*** (4.01)
Panel D: B/M and related abnormal returns				
B/M	0.360*** (107.05)	0.642*** (260.56)	0.955*** (265.39)	1.688*** (98.32)
AR	-0.131*** (-11.87)	-0.075*** (-6.96)	0.008 (0.84)	0.110*** (10.00)

Note: *, **, and *** indicate statistical significance at the 0.10, 0.05, and 0.01 level, respectively. We further run a regression analysis of each fundamental-to-price ratio on short interest. The multivariate regression framework is provided as follows:

$$\text{SHORT} = a_0 + a_1 \text{FUNDAMENTAL} + a_2 \text{SIZE} + a_3 \text{HOLDING} + e \quad (1)$$

where: SHORT is short interest three months after the end of the last fiscal year. FUNDAMENTAL is fundamental-to-price ratio (E/P, D/P, CF/P, or B/M) at the end of the last fiscal year. SIZE is the natural logarithm of market value which is the product of the number of shares outstanding and the market price at the end of the last fiscal year (in millions). HOLDING is institutional holdings of foreign investors at the last fiscal year-end as the percent of outstanding shares of the firm held by foreign investors.⁸

Table 2 presents the regression analysis of each fundamental-to-price ratio on short interest. Panel A of Table 2 shows that short interest of institutional traders is negatively

⁸ In this paper, institutional holdings are measured by stock holdings by foreign investors because foreign investors account for most of overall institutional holdings on the TWSE.

associated with each fundamental-to-price ratio. E/P, D/P, CF/P, and B/M have negative impact on short interest of institutional traders and the coefficients of E/P and CF/P (-0.743 and -0.132) are significant. Moreover, Panel B of Table 2 shows that short interest of individual traders is also negatively associated with each fundamental-to-price ratio. E/P, D/P, CF/P, and B/M have significantly negative impact on short interest of individual traders with the coefficients -0.526, -0.839, -0.143, and -0.123. However, institutional short interest is positively associated with institutional holdings of foreign investors, but individual short interest is significantly negatively associated with institutional holdings of foreign investors. Overall, the results in Table 2 confirm that short sellers would target stocks with low fundamental-to-price ratios, but the preferences of institutional and individual short sellers are different.

Table 2

The regression analysis of each fundamental-to-price ratio on short interest

	Model			
	(1)	(2)	(3)	(4)
Panel A: Dependent variable is institutional short selling				
E/P	-0.743*** (-2.98)			
D/P		-0.134 (-0.37)		
CF/P			-0.132** (-1.99)	
B/M				-0.031 (-1.27)
SIZE	0.056*** (4.82)	0.055*** (4.45)	0.058*** (4.93)	0.050*** (4.60)
HOLDING	0.003*** (2.73)	0.003*** (2.69)	0.003** (2.46)	0.003*** (2.79)
Panel B: Dependent variable is individual short selling				
E/P	-0.526*** (-3.45)			
D/P		-0.839*** (-4.13)		
CF/P			-0.143*** (-3.08)	
B/M				-0.123*** (-7.71)
SIZE	0.010	0.007	0.007	-0.011

	Model			
	(1)	(2)	(3)	(4)
	(1.34)	(0.82)	(0.96)	(-1.43)
HOLDING	-0.003***	-0.003***	-0.003***	-0.003***
	(-4.15)	(-4.15)	(-3.78)	(-3.82)

Note: *, **, and, *** indicate statistical significance at the 0.10, 0.05, and 0.01 level, respectively.

III.2. Institutional short selling vs. individual short selling

Table 3 provides evidence on the relation between institutional and individual short selling and abnormal returns. Firm-year observations are assigned to four quartiles based on the relative magnitude of institutional and individual short selling.⁹ The ranking procedure is carried out for each short interest and each calendar year separately. We then pool the observations across calendar years such that quartile 1 contains the highest values of each short and quartile 4 contains the lowest values of each short. Panel A of Table 3 reports abnormal returns for four quartiles on institutional short selling. The abnormal returns vary from -0.130 in quartile 1 to -0.037 in quartile 4 and the lowest abnormal returns are located at the highest institutional short selling (quartile 1). Panel B of Table 3 reports abnormal returns for four quartiles on individual short selling. The abnormal returns vary from -0.122 in quartile 1 to 0.038 in quartile 4 and the lowest abnormal returns is located at the highest individual short selling (quartile 1). Overall, the highest short positions of either institutional traders or individual traders result in the lowest abnormal returns.

Table 3

The relation between institutional and individual short selling and abnormal returns

	Quartile			
	High	2	3	Low
Panel A: Institutional short selling and related abnormal returns				
Short	0.810***	0.194***	0.077***	0.017***
	(22.45)	(78.00)	(63.73)	(29.96)
AR	-0.130***	-0.100***	-0.022	-0.037***
	(-8.20)	(-6.76)	(-1.54)	(-2.72)
Panel B: Individual short selling and related abnormal returns				
Short	0.647***	0.082***	0.021***	0.004***
	(23.42)	(76.15)	(70.23)	(41.27)
AR	-0.122***	-0.065***	-0.001	0.038***
	(-9.30)	(-6.02)	(-0.06)	(3.41)

Note: *, **, and, *** indicate statistical significance at the 0.10, 0.05, and 0.01 level, respectively.

⁹ For comparative purposes, we also exclude observations when the numerator is negative or zero in institutional and individual short selling.

Since both institutional and individual short selling have negative effects on stock returns, this paper further examines which short sellers by individuals or institutions are better informed. In order to control the impact of short selling, we restrict the sample in the observations with 0.5%-2.5% of their outstanding shares shorted.¹⁰ Table 4 presents the differences of the effects of institutional and individual short selling on abnormal returns. Table 4 indicates that short selling between institutions and individuals are insignificant. Similarly, the differences of abnormal returns for institutional and individual short selling are also insignificant. Combined the results of Table 3 and Table 4, individual and institutional short sellers are both informed traders.

Table 4

The differences of the impact of institutional and individual short selling on abnormal returns

	Institutions	Individuals	Difference
	(1)	(2)	(1)-(2)
Short	1.009	0.948	0.061 (1.37)
AR	-0.143	-0.108	-0.035 (-0.99)

Note: *, **, and, *** indicate statistical significance at the 0.10, 0.05, and 0.01 level, respectively.

III.3. Robustness check

Another question is that whether short sellers are informed during the financial tsunami. To address this issue, we select observations during years 2007-2008 and examine the impact of the heavy institutional and individual short selling on abnormal returns.¹¹ Table 5 documents the effects of the heavy short selling by institutions and individuals on abnormal returns during the financial tsunami. The evidence in Table 5 indicates that abnormal return of the heavy institutional short selling, -0.127, is significant with the t-value of -3.79, and abnormal return of the heavy individual short selling, -0.225, is significant with the t-value of -9.46. Therefore, during the financial tsunami, institutional and individual short sellers are still informed about future returns.

¹⁰ According to Dechow et al. (2001), high short is defined as that short interest is larger than 0.5% of their outstanding shares shorted. Furthermore, short interest over 2.5% is fewer in our sample. Hence, this paper selects the observations of short interest with 0.5%-2.5% for comparing the influence of the high short selling by institutions and individuals on abnormal returns.

¹¹ We sort the sample of individual short selling into four quartiles based on the magnitude of the short position in the stocks, but sort the sample of institutional short selling into two categories because observations of institutional short selling are fewer during the financial tsunami.

Table 5

The impact of institutional and individual short selling on abnormal returns during the financial tsunami

	Institutions	Individuals
Short	0.656*** (11.80)	0.732*** (11.93)
AR	-0.127*** (-3.79)	-0.225*** (-9.46)

Note: *, **, and, *** indicate statistical significance at the 0.10, 0.05, and 0.01 level, respectively.

IV. Conclusion

In this paper, we examine whether the short sales of individuals or institutions are informed on the TWSE. Different from NYSE and other main stock markets with rare shorting by individuals, the short sales of individuals on the TWSE is very popular. This provides an opportunity to investigate the information content of individual short selling as well as institutional short selling.

The empirical results are as follows. First, individuals and institutions take more heavy short positions in stocks with lower fundamental values. The finding is consistent with Dechow *et al.* (2001) that short sellers focus more heavily on stocks with low ratios of fundamentals to value. However, institutional short selling is positively associated with institutional holdings, but individual short selling is negatively associated with institutional holdings. The finding shows that the preferences of institutional and individual short sellers are different and is inconsistent with Dechow *et al.* (2001) that short selling is positively related to institutional holdings. Second, heavy short selling results in negative abnormal return significantly, and the amount of negative abnormal return is not different between short selling of individuals and institutions. The finding is consistent with Asquith and Meulbroek (1996) and other prior studies that document a negative relation between the level of short interest and future stock returns. However, the finding is inconsistent with Boehmer *et al.* (2008) that short sales by individuals are completely uninformed. Third, the finding is still robust during the financial tsunami. Thus, in the Taiwan stock market, institutional short sellers and individual short sellers are both informed traders.

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