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# The Impact of Financial Constraints on the Convertible Bond Announcement Returns

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**Abstract:** As of now, very few research studies have examined the effects of financial constraints on the short- and long-term performances of companies after their announcement of convertible bonds. Due to asymmetric information, previous studies consider issuance of convertible bonds as negative news. As a result, the short- and long-term performances of companies generally decline after their convertible bond announcement. This study argues that when companies have investment plans, they are expected to have higher future cash flows. They will become increasingly more valuable regardless of the fact that they raise funds through the issue of convertible bonds (due to financial constraints), positively affecting the performance of companies. The results indicate that financial constraints have no effect on short-term performance, but did have a significantly positive impact on the long-term performance of companies after their issuance of convertible bonds.

**Keywords:** convertible bond; financial constraints; stock performance

## 1. Motivation

The previous literature has pointed out that financial constraints significantly influence companies. Fazzari et al. (1988), Kaplan and Zingales (1997), and Cleary (1999) proved that financial constraints affect the investment decisions of a company. Hoshi et al. (1991), Fohlin (1998), and Houston and James (2001) stated that the relationship between companies and banks affects the degree of financial constraints. Fazzari et al. (1988), Hoshi et al. (1991), Hubbard et al. (1995), and Cleary (1999) assumed that dividend payout ratio also affects the degree of financial constraints. Chen and Wang (2012) suggested that companies with financial constraints have poor stock repurchase performance of treasury stock because they face a high financial risk.

Convertible bonds, with the dual characteristics of stocks and bonds, help alleviate the problem of information and agency costs caused by the external financing of companies. However, numerous studies have specified that the release and announcement of convertible bonds generate unfavorable messages, which in turn, have a negative effect on stock prices, causing issuing firms to receive negative stock performance (e.g., Dann and Mikkelson 1984; Mikkelson and Partch 1986; Stein 1992; Wolfe et al. 1999; Hillion and Vermaelen 2004; Ammann et al. 2006; Duca et al. 2012). For example, Duca et al. (2012) showed that convertible offerings announced between 1984 and 1999 induced average abnormal stock returns of  $-1.69\%$ , and convertible announcement effects over the periods from 2000–2008 are more than twice as negative ( $-4.59\%$ ) in US convertible debt. However, Kim and Han (2019) indicated that convertible bond issues have significantly positive cumulative abnormal returns around the announcement in Korea. In particular, issuing firms that state capital expenditure

as the use of proceeds have significantly higher cumulative abnormal returns compared to firms that state other purposes.

Among past literature, very few studies have been done examining the effects of financial constraints on the short- and long-term performance of companies after their announcement of issuing convertible bonds. The results of these limited research studies show that the bond issue announcement has a negative effect on the performance of companies. Theoretically, a company's performance is reflected in its stock price movement—a company that has better performance implies better returns and dividends, which in turn will be reflected in its stock price. The aim of this study is to investigate the relationship between the announcement of issuing convertible bonds and the stock price performance of a company with financial constraints.

Additionally, Luo (2011) argues that in comparison with companies without financial constraints, companies with financial constraints would more effectively use the limited capital that they raise in the future. The result indicates that the executives of the companies with financial constraints are relatively effective in terms of managing capital spending. Therefore, this study argues that companies with financial constraints tend to raise their funds by issuing convertible bonds that have a positive influence on innovation and investment activities, which in turn are expected to cause higher future cash flows and increases in asset value. Thus, the objective of this study is to also investigate the effects of financial constraints on the short- and long-term performances of companies after their announcement of convertible bond issuance.

The remainder of this paper is arranged as follows. Section 2 describes the data and model, Section 3 introduces the empirical variables, and Section 4 presents the empirical results. Findings are summarized in Section 5.

## 2. The Model

This study adopts the pooled ordinary least squares regression approach to investigate the relationship between the financial constraint and firm stock performance of convertible bond issuance.<sup>1</sup> The specifications of the model are as follows:

$$CAR(\tau_1, \tau_2) = \beta_0 + \beta_1 HFC_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 MB_{i,t} + \beta_4 FCFratio_{i,t} + \beta_5 STDAR_{i,t} + \beta_6 LEV_{i,t} + \beta_7 Rm\_Rf_{i,t} + \varepsilon_{i,t} \quad (1)$$

where subscripts  $i$  and  $t$  indicate a sampled company and current period, respectively. In this study, the cumulative abnormal returns ( $CAR$ ) was considered as the dependent variable, and the financial constraint indicator ( $HFC$ ) was set as the independent variable. If  $CAR$  is influenced by financial constraint, the coefficient  $\beta_1$  will be statistically significant.  $\beta_1$  is expected to be positive. This implies that companies with financial constraints tend to raise their funds by issuing convertible bonds that have a positive influence on innovation and investment activities, which in turn are expected to have higher future cash flows and increases in asset value.

Following the works of Marsh (1982), McConnell and Muscarella (1985), Jensen (1986), Lakonishok and Vermaelen (1990), Pilotte (1992), Spiess and Affleck-Graves (1995), and Pettengill et al. (2002), this study adopted company size ( $SIZE$ ), market net value ratio ( $MB$ ), free cash flow ratio ( $FCFratio$ ), information asymmetry ( $STDAR$ ), debt ratio ( $LEV$ ), and market trend ( $RmRf$ ).  $SIZE$  refers to the natural logarithm of a firm's market value.  $MB$  refers to the ratio of market value of a company to its net worth.  $FCFratio$  refers to the ratio of free cash flow to total assets.  $STDAR$  is the residual standard deviation of the daily rate of return, measured according to market mode.  $LEV$  is the ratio of total debt to total assets.  $RmRf$  is the difference between the monthly return on Weighted Stock Index and risk-free rate.

<sup>1</sup> Panel data regression was run with fixed effect in addition to pooled ordinary least regression approach. This yielded favorable results which support our claim, that companies with high financial constraints have higher long-term performance after issuing convertible bonds.

Moreover, using the heteroscedasticity consistent estimator introduced by White (1980), this study adjusted the standard error of the estimated parameters and modified the heterogeneity variation. Considering the date of announcement and the completeness of the variables, there were a total of 418 TAIEX-listed and OTC-listed companies issuing convertible bonds in Taiwan collected from Taiwan Economics Journal covering the period from 2005 to 2009.

### 3. Empirical Variables

#### 3.1. Financial Constraint

Adopting the Financial Constraint Index (*FCindex*), formulated by Kaplan and Zingales (1997)<sup>2</sup>, this study divided the samples into two groups: high financial constraints *HFC* and low financial constraints *LFC*. *HFC* was set to 1 if the *FCindex* of a sample company was higher than the mean value of the industry; otherwise, it was 0. The *FCindex* estimated by Kaplan and Zingales (1997) is denoted as

$$FCindex = -1.002 \times \left( \frac{Cashflow}{K} \right) + 0.283 \times Q + 3.139 \times \left( \frac{Debt}{K} \right) - 39.368 \times \left( \frac{Dividends}{K} \right) - 1.315 \times \left( \frac{Cash}{K} \right) \quad (2)$$

(0.23) (0.08) (0.45) (6.10) (0.29)

where *K* refers to the total assets; *Cashflow* represents the net profit after the tax subtracted by the abnormal item and depreciation; *Q* is the proxy variable of Tobin'Q, that is, the sum of the market value of equity and the book value of debt divided by the book value of the asset; *Debt* is the total debt; *Dividends* refers to the total cash dividends paid by the enterprise; *Cash* is the cash and cash equivalents; and the figures in brackets below the coefficients in Equation (2) are the standard deviations.

#### 3.2. Performance Index

The market model was used to measure the short- and long-term performances after the announcement of convertible bonds. OLS was adopted to establish the regression model of individual securities on the market portfolio.

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t} \quad (3)$$

where  $R_{i,t}$  is the rate of return of the stock of company *i* in day (month) *t*;  $R_{m,t}$  is the rate of return of the market portfolio in day (month) *t* regarding the daily (monthly) rate of return of the Taiwan weighted stock index;  $\alpha$  and  $\beta$  are regression coefficients; and  $\varepsilon$  is the error term.

The date (month) of the announcement of the convertible bonds was regarded as the event day (month); 30 days after the announcement was set as the short-term event period; and 60 months after the announcement was regarded as the long-term event period. The period from 31 days to 210 days before the announcement was considered the short-term estimating period and the period from 12 months to 60 months was regarded as the long-term estimating period. A total of 180 days and 49 months comprised the observation period.

Abnormal returns (ARs) was calculated with the actual return in event period minus the expected return estimated by the market model. Mean ARs refers to the mean value of the ARs of all sample companies. The short-term (long-term) cumulative abnormal returns  $SCAR0_t$  ( $LCAR0_t$ ) denote the accumulated AR by company *i* from the day (month) of announcement of convertible bonds, 0, to day (month) *t*. The cumulative mean ARs represent the cumulative value of the mean ARs from the day (month) of announcement of convertible bonds 0 to day (month).

<sup>2</sup> The index measuring the degree of companies' financial constraints were widely used, including by Lamont et al. (2001), Baker et al. (2003), Chen et al. (2007), and Hennessy et al. (2007). In following Whited and Wu (2006), the WW index was included to measure whether a company has financial constraints. The result is consistent with the empirical results.

## 4. Empirical Analysis

### 4.1. Industrial Distribution of Sample Companies and Events

Table 1 shows the sample companies, events of the announcement of convertible bonds, and industrial distribution. The table particularly indicates 418 sample companies and 643 events of announcements of convertible bonds.

**Table 1.** Sample companies, events of the announcement of convertible bonds, and industrial distribution.

Industry	Number of Companies	%	Number of Events	%
Food	4	0.96%	4	0.62%
Plastic	4	0.96%	7	1.09%
Textile	9	2.15%	15	2.33%
Electric Machinery	18	4.31%	25	3.89%
Electric and Cable	6	1.44%	8	1.24%
Biotechnology	23	5.50%	32	4.98%
Glass and Ceramic	1	0.24%	2	0.31%
Paper and Pulp	5	1.20%	7	1.09%
Iron and Steel	15	3.59%	28	4.35%
Rubber	4	0.96%	5	0.78%
Automobile	2	0.48%	5	0.78%
Electronics	267	63.88%	408	63.45%
Building Material and Construction	23	5.50%	37	5.75%
Shipping and Transportation	5	1.20%	13	2.02%
Tourism	2	0.48%	2	0.31%
Trading and Consumers' Goods	6	1.44%	11	1.71%
Oil, Gas, and Electricity	4	0.96%	5	0.78%
others	20	4.78%	29	4.51%
Total	418	100.00%	643	100.00%

### 4.2. Analysis on the Difference in Short- and Long-Term Performances after the Announcement of Convertible Bonds between High and Low Financial Constraints

Table 2 demonstrates that the announcements of convertible bonds by low- and high-financial constraint companies negatively affect their short- and long-term performances. However, the negative effect of high-financial constraint companies is lower than that of low-financial constraint companies. For long-term performance, the cumulative AR,  $LCAR0_{36}$  of high-financial constraint companies is  $-25.53\%$ , whereas that of low-financial constraint companies is  $-46.97\%$ . The difference between the high and low financial constraints is  $21.44\%$ , with a significance level of  $5\%$ . The cumulative ARs  $LCAR0_{24}$ ,  $LCAR0_{48}$ , and  $LCAR0_{60}$  have the same empirical result. These findings suggest that the companies with high financial constraints have higher long-term performance than those with low financial constraints.

**Table 2.** The effects of announcement of convertible bonds by low- and high-financial constraint companies on their short- and long-term performances.

Panel A Short-Term Cumulative Abnormal Returns <sup>1</sup>				
Performance	High Financial Constraints	Low Financial Constraints	Difference	<i>p</i> -Value
$SCAR0_5$	-1.10	-0.65	-0.46	0.3639
$SCAR0_{10}$	-1.29	-1.56	0.27	0.6796
$SCAR0_{15}$	-1.27	-1.65	0.38	0.6358
$SCAR0_{20}$	-1.77	-2.35	0.58	0.5399
$SCAR0_{25}$	-2.15	-2.21	0.06	0.9616
$SCAR0_{30}$	-2.06	-2.62	0.56	0.6502

Table 2. Cont.

Panel B Long-Term Cumulative Abnormal Returns <sup>2</sup>				
Performance	High Financial Constraints	Low Financial Constraints	Difference	p-Value
LCAR0_12	−12.68	−19.08	6.40	0.1951
LCAR0_24	−21.35	−35.21	13.86 *	0.0656
LCAR0_36	−25.53	−46.97	21.44 **	0.0347
LCAR0_48	−38.09	−62.73	24.64 *	0.0546
LCAR0_60	−47.85	−78.79	30.94 **	0.0425

Note: \* significant at 10% level; \*\* significant at 5% level. <sup>1</sup> The short-term performance including the cumulative AR from 0 to 5 days (SCAR0\_5), from 0 to 10 days (SCAR0\_10), from 0 to 15 days (SCAR0\_15), from 0 to 20 days (SCAR0\_20), from 0 to 25 days (SCAR0\_25), and from 0 to 30 days (SCAR0\_30). <sup>2</sup> The long-term performance, including the cumulative AR from 0 to 12 months (LCAR0\_12), from 0 to 24 months (LCAR0\_24), from 0 to 36 months (LCAR0\_36), from 0 to 48 months (LCAR0\_48), and from 0 to 60 months (LCAR0\_60).

#### 4.3. Short-Term Performance from High and Low Financial Constraints

Table 3 illustrates that the short-term cumulative AR of high-financial constraint companies is negative. The cumulative ARs SCAR0\_5, SCAR0\_10, SCAR0\_20, and SCAR0\_30 are −1.20%, −1.38%, −1.96%, and −2.31%, respectively, with statistical significance. The companies with low financial constraints have the same empirical results. These findings are consistent with the negative AR after the announcement of convertible bonds obtained by [Dann and Mikkelson \(1984\)](#), [Stein \(1992\)](#), [Wolfe et al. \(1999\)](#), [Hillion and Vermaelen \(2004\)](#), [Ammann et al. \(2006\)](#), and [Duca et al. \(2012\)](#).

Table 3. Short-term performances of high and low financial constraints.

Performance	High Financial Constraints		Low Financial Constraints	
	Rate of Return	t-Value	Rate of Return	t-Value
SCAR0_0	−0.09	−0.64	−0.25 *	−1.65
SCAR0_1	−0.43 **	−2.10	−0.36	−1.55
SCAR0_2	−0.73 ***	−2.92	−0.60 **	−2.15
SCAR0_3	−0.78 ***	−2.62	−0.66 **	−2.04
SCAR0_4	−0.89 ***	−2.60	−0.53 *	−1.53
SCAR0_5	−1.20 ***	−3.34	−0.65 *	−1.71
SCAR0_6	−1.49 ***	−3.92	−0.96 **	−2.40
SCAR0_7	−1.55 ***	−3.76	−1.12 ***	−2.69
SCAR0_8	−1.60 ***	−3.81	−1.24 ***	−2.83
SCAR0_9	−1.67 ***	−3.77	−1.41 ***	−3.02
SCAR0_10	−1.38 ***	−3.05	−1.63 ***	−3.33
SCAR0_11	−1.24 **	−2.56	−1.44 ***	−2.72
SCAR0_12	−1.24 **	−2.46	−1.64 ***	−2.91
SCAR0_13	−1.34 **	−2.54	−1.61 ***	−2.77
SCAR0_14	−1.31 **	−2.35	−1.67 ***	−2.87
SCAR0_15	−1.43 **	−2.53	−1.57 **	−2.57
SCAR0_16	−1.50 ***	−2.66	−1.56 **	−2.41
SCAR0_17	−1.80 ***	−3.06	−1.64 **	−2.51
SCAR0_18	−1.90 ***	−3.08	−1.90 ***	−2.88
SCAR0_19	−1.93 ***	−3.03	−2.06 ***	−3.02
SCAR0_20	−1.96 ***	−2.97	−2.28 ***	−3.20
SCAR0_21	−1.90 ***	−2.80	−2.32 ***	−3.17
SCAR0_22	−2.04 ***	−2.93	−2.22 ***	−2.99
SCAR0_23	−2.23 ***	−3.06	−2.23 ***	−2.95
SCAR0_24	−2.27 ***	−3.07	−2.16 ***	−2.83
SCAR0_25	−2.42 ***	−3.24	−2.20 ***	−2.80
SCAR0_26	−2.24 ***	−2.90	−2.06 ***	−2.60
SCAR0_27	−2.28 ***	−2.90	−2.20 ***	−2.71
SCAR0_28	−2.24 ***	−2.79	−2.31 ***	−2.72
SCAR0_29	−2.17 ***	−2.64	−2.51 ***	−2.96
SCAR0_30	−2.31 ***	−2.76	−2.69 ***	−3.07

Note: \* significant at 10% level; \*\* significant at 5% level; \*\*\* significant at 1% level.

#### 4.4. Long-Term Performance from High and Low Financial Constraints

Table 4 shows that the cumulative ARs of the companies with high and low financial constraints are negative. However, the comparative analysis indicates that the cumulative ARs of the companies with high financial constraints, namely *LCAR0\_10*, *LCAR0\_20*, *LCAR0\_30*, *LCAR0\_40*, *LCAR0\_50*, and *LCAR0\_60*, are  $-9.72\%$ ,  $-21.03\%$ ,  $-23.83\%$ ,  $-31.99\%$ ,  $-43.00\%$ , and  $-49.84\%$ , respectively. For the same set of cumulative ARs, the companies with low financial constraints have  $-13.26\%$ ,  $-28.57\%$ ,  $-39.68\%$ ,  $-49.46\%$ ,  $-65.08\%$ , and  $-78.66\%$ . In summary, the cumulative AR of high-financial constraint companies is higher than that of low-financial constraint companies, with an increasing difference.

**Table 4.** Long-term performances of high and low financial constraints.

Performance	High Financial Constraints		Low Financial Constraints		Performance	High Financial Constraints		Low Financial Constraints	
	Return	t-Value	Return	t-Value		Return	t-Value	Return	t-Value
<i>SCAR0_t</i>					<i>LCAR0_t</i>				
<i>LCAR0_0</i>	-1.39 **	-2.02	-1.66 **	-1.87	<i>LCAR0_31</i>	-24.38 ***	-3.88	-40.01 ***	-5.68
<i>LCAR0_1</i>	-1.59	-1.42	-2.49 **	-2.02	<i>LCAR0_32</i>	-24.84 ***	-3.87	-40.38 ***	-5.59
<i>LCAR0_2</i>	-3.28 **	-2.31	-3.32 **	-2.04	<i>LCAR0_33</i>	-25.09 ***	-3.85	-40.94 ***	-5.50
<i>LCAR0_3</i>	-3.66 **	-2.12	-4.05 *	-2.19	<i>LCAR0_34</i>	-25.71 ***	-3.86	-41.43 ***	-5.41
<i>LCAR0_4</i>	-4.55 **	-2.30	-4.12 **	-1.91	<i>LCAR0_35</i>	-25.57 ***	-3.74	-42.06 ***	-5.42
<i>LCAR0_5</i>	-4.99 **	-2.25	-5.33 **	-2.20	<i>LCAR0_36</i>	-26.54 ***	-3.79	-44.48 ***	-5.60
<i>LCAR0_6</i>	-5.66 **	-2.37	-7.34 ***	-2.83	<i>LCAR0_37</i>	-28.51 ***	-3.98	-46.34 ***	-5.69
<i>LCAR0_7</i>	-7.57 ***	-2.88	-9.49 ***	-3.54	<i>LCAR0_38</i>	-28.88 ***	-3.95	-47.34 ***	-5.64
<i>LCAR0_8</i>	-8.38 ***	-2.95	-10.23 ***	-3.49	<i>LCAR0_39</i>	-30.58 ***	-4.13	-48.85 ***	-5.66
<i>LCAR0_9</i>	-8.99 ***	-3.00	-11.99 ***	-3.84	<i>LCAR0_40</i>	-31.99 ***	-4.26	-49.46 ***	-5.61
<i>LCAR0_10</i>	-9.72 ***	-2.94	-13.26 ***	-4.03	<i>LCAR0_41</i>	-32.89 ***	-4.29	-50.94 ***	-5.67
<i>LCAR0_11</i>	-10.57 ***	-3.11	-16.49 ***	-4.98	<i>LCAR0_42</i>	-34.89 ***	-4.46	-52.21 ***	-5.73
<i>LCAR0_12</i>	-13.68 ***	-3.72	-17.83 ***	-5.00	<i>LCAR0_43</i>	-35.89 ***	-4.53	-52.69 ***	-5.74
<i>LCAR0_13</i>	-16.02 ***	-4.24	-19.04 ***	-5.13	<i>LCAR0_44</i>	-36.87 ***	-4.52	-54.61 ***	-5.84
<i>LCAR0_14</i>	-16.86 ***	-4.31	-21.37 ***	-5.38	<i>LCAR0_45</i>	-36.77 ***	-4.44	-55.44 ***	-5.81
<i>LCAR0_15</i>	-18.35 ***	-4.54	-22.78 ***	-5.37	<i>LCAR0_46</i>	-37.53 ***	-4.5	-57.24 ***	-5.87
<i>LCAR0_16</i>	-20.61 ***	-4.95	-24.84 ***	-5.67	<i>LCAR0_47</i>	-37.31 ***	-4.44	-59.54 ***	-5.94
<i>LCAR0_17</i>	-20.96 ***	-4.86	-25.23 ***	-5.54	<i>LCAR0_48</i>	-40.10 ***	-4.68	-60.64 ***	-5.92
<i>LCAR0_18</i>	-21.84 ***	-4.92	-26.14 ***	-5.56	<i>LCAR0_49</i>	-42.24 ***	-4.85	-63.98 ***	-6.17
<i>LCAR0_19</i>	-21.15 ***	-4.60	-26.43 ***	-5.43	<i>LCAR0_50</i>	-43.00 ***	-4.87	-65.08 ***	-6.16
<i>LCAR0_20</i>	-21.03 ***	-4.49	-28.57 ***	-5.59	<i>LCAR0_51</i>	-44.90 ***	-5.00	-66.14 ***	-6.15
<i>LCAR0_21</i>	-21.74 ***	-4.54	-30.19 ***	-5.60	<i>LCAR0_52</i>	-45.75 ***	-5.03	-67.73 ***	-6.22
<i>LCAR0_22</i>	-22.26 ***	-4.49	-30.98 ***	-5.50	<i>LCAR0_53</i>	-46.54 ***	-5.05	-69.73 ***	-6.33
<i>LCAR0_23</i>	-22.79 ***	-4.44	-33.12 ***	-5.89	<i>LCAR0_54</i>	-46.19 ***	-4.93	-71.03 ***	-6.27
<i>LCAR0_24</i>	-22.65 ***	-4.32	-33.42 ***	-5.74	<i>LCAR0_55</i>	-47.39 ***	-4.96	-72.71 ***	-6.29
<i>LCAR0_25</i>	-23.35 ***	-4.32	-34.08 ***	-5.72	<i>LCAR0_56</i>	-47.46 ***	-4.91	-73.11 ***	-6.26
<i>LCAR0_26</i>	-23.34 ***	-4.17	-35.07 ***	-5.80	<i>LCAR0_57</i>	-48.07 ***	-4.96	-73.82 ***	-6.21
<i>LCAR0_27</i>	-23.93 ***	-4.10	-36.49 ***	-5.95	<i>LCAR0_58</i>	-48.65 ***	-4.97	-74.48 ***	-6.19
<i>LCAR0_28</i>	-24.84 ***	-4.14	-38.68 ***	-6.15	<i>LCAR0_59</i>	-48.94 ***	-4.96	-75.88 ***	-6.23
<i>LCAR0_29</i>	-25.04 ***	-4.08	-37.96 ***	-5.83	<i>LCAR0_60</i>	-49.84 ***	-4.98	-78.66 ***	-6.31
<i>LCAR0_30</i>	-23.83 ***	-3.84	-39.68 ***	-5.91					

Note: \* significant at 10% level; \*\* significant at 5% level; \*\*\* significant at 1% level.

#### 4.5. Effect of Financial Constraints on Short-Term Performance after the Announcement of Convertible Bonds

The results of the regression analysis in Table 5 imply that the regression coefficients of the effects of financial constraints (*HFC*) on the cumulative ARs *SCAR0\_5*, *SCAR0\_10*, *SCAR0\_15*, *SCAR0\_20*, *SCAR0\_25*, and *SCAR0\_30* are  $-0.0064$ ,  $0.0034$ ,  $0.0020$ ,  $0.0100$ ,  $0.0074$ , and  $0.0100$ , respectively, without statistical significance. This finding shows that financial constraints insignificantly affect the short-term performance of companies after their announcement of convertible bonds.

**Table 5.** Effects of financial constraints on the short-term performances of companies after their issuance of convertible bonds.

Independent Variable	Performance						
	SCAR0_5	SCAR0_10	SCAR0_15	SCAR0_20	SCAR0_25	SCAR0_30	
Intercept	0.0188 (0.0179)	−0.0211 (0.0244)	−0.0106 (0.0300)	−0.0065 (0.0349)	−0.0253 (0.0393)	−0.0157 (0.0446)	
HFC	−0.0064 (0.0064)	0.0034 (0.0079)	0.0020 (0.0097)	0.0100 (0.0113)	0.0074 (0.0131)	0.0100 (0.0142)	
SIZE	−0.0029 (0.0020)	0.0015 (0.0027)	−0.0005 (0.0034)	−0.0004 (0.0040)	−0.0004 (0.0044)	0.0017 (0.0050)	
MB	−0.0014 (0.0019)	−0.0033 (0.0028)	−0.0009 (0.0035)	−0.0008 (0.0043)	−0.0011 (0.0049)	−0.0035 (0.0056)	
FCFratio	0.0237 (0.0152)	0.0248 (0.0225)	0.0303 (0.0303)	0.0371 (0.0296)	0.0196 (0.0386)	0.0343 (0.0372)	
STDAR	−0.0161 (0.0280)	0.0001 (0.0486)	0.0208 (0.0620)	0.0225 (0.0673)	0.0119 (0.0746)	−0.0378 (0.0986)	
LEV	0.0008 (0.0244)	−0.0105 (0.0318)	−0.0095 (0.0386)	−0.0491 (0.0439)	−0.0688 (0.0516)	−0.0583 (0.0586)	
RmRf	0.0071 (0.0398)	0.0714 (0.0515)	0.1458 ** (0.0638)	0.1244 * (0.0713)	0.1761 ** (0.0826)	0.2784 *** (0.0950)	
Adj.R <sup>2</sup>	0.0115	0.0096	0.0136	0.0113	0.0133	0.0225	
F-value	0.4344	0.5657	0.311	0.4433	0.3262	0.0569	

Note: \* significant at 10% level; \*\* significant at 5% level; \*\*\* significant at 1% level.

#### 4.6. Effect of Financial Constraints on Long-Term Performance after the Announcement of Convertible Bonds

Table 6 shows that the regression coefficients of the effects of financial constraints (HFC) on the cumulative ARs *LCAR0\_12*, *LCAR0\_24*, *LCAR0\_36*, *LCAR0\_48*, and *LCAR0\_60* are 0.1199, 0.2043, 0.2587, 0.2378, and 0.3127, respectively, with statistical significance. This observation suggests that financial constraints positively affect the long-term cumulative AR of companies, thus the companies with high financial constraints have higher long-term performance after they issue convertible bonds.<sup>3</sup>

**Table 6.** Effects of financial constraints on the long-term performances of companies after their issuance of convertible bonds.

Independent Variable	Performance				
	LCAR0_12	LCAR0_24	LCAR0_36	LCAR0_48	LCAR0_60
Intercept	0.1850 (0.1777)	0.2522 (0.2498)	0.6774 ** (0.3276)	0.7336 * (0.3994)	0.9665 ** (0.4852)
HFC	0.1199 ** (0.0571)	0.2043 ** (0.0877)	0.2587 ** (0.1133)	0.2378 * (0.1415)	0.3127 * (0.1681)
SIZE	−0.0015 (0.0219)	0.0118 (0.0292)	−0.0332 (0.0379)	−0.0455 (0.0471)	−0.0685 (0.0562)
MB	−0.0663 * (0.0363)	−0.1439 *** (0.0387)	−0.1839 *** (0.0471)	−0.2376 *** (0.0621)	−0.3031 *** (0.0747)
FCFratio	0.4405 ** (0.1791)	0.4677 * (0.2558)	0.6997 ** (0.3144)	0.7404 * (0.3864)	0.8466 * (0.4332)
STDAR	−2.4905 *** (0.6469)	−5.0979 *** (0.8699)	−7.1942 *** (1.2583)	−8.6716 *** (1.6700)	−9.6888 *** (2.0607)
LEV	−0.4961 ** (0.2105)	−0.7041 ** (0.3011)	−0.7173 * (0.4190)	−0.5391 (0.5418)	−0.6762 (0.6353)
RmRf	−0.0640 (0.4306)	−0.5177 (0.5495)	−0.3523 (0.6946)	−0.3101 (0.8714)	−0.4929 (1.0643)
Adj.R <sup>2</sup>	0.1136	0.1982	0.2278	0.225	0.2304
F-value	8.18 ***	15.78 ***	18.84 ***	18.54 ***	19.12 ***

Note: \* significant at 10% level; \*\* significant at 5% level; \*\*\* significant at 1% level.

<sup>3</sup> Panel data regression was run with fixed effect in addition to pooled ordinary least regression approach. This yielded favorable results which support our claim that companies with high financial constraints have higher long-term performance after issuing convertible bonds.

## 5. Conclusions

The previous literature posits that convertible bonds negatively affect stock performance. They argue that investors believe that stock prices are overvalued and that companies have high risk because of the existence of information asymmetry. Therefore, stock performance becomes poor after the announcement of convertible bonds. By arguing that companies under financial constraint will cautiously and efficiently use their funds. This study investigates the effects of financial constraints on short- and long-term performances of companies after their announcement of convertible bonds. The empirical results demonstrate that financial constraints do not have any significant short-term effects, but they do have significant positive long-term effects on the performances of companies. In addition, high financial constraints have higher long-term cumulative AR than those with low financial constraints.

Past literature have shown that the companies' convertible bond announcement negatively affect their stock prices. However, the result of our study shows the opposite. Thus, investors are recommended to choose companies with high financial constraints if they are considering investing in those that are going to issue convertible bonds, which is beneficial with regards to planning investment strategies.

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