Market Signals Associated with Taiwan REIT IPOs

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Abstract

The study examines the influence of REIT (real estate investment trust) IPO (initial public offering) announcements in Taiwan on the returns of construction stocks, the non-REIT real estate stocks in Taiwan (Liow and Sim, 2006), using the Event Study method. Sing, Ho and Mak (2002) found that announcements of REIT IPOs had negative impacts on non-REIT real estate stocks in Malaysia. In contrast, we found that REIT IPO issues had favorable effects on these stocks in Taiwan following a series of news announcements, including the REIT IPO filing approved by the Financial Supervision Commission, the offering date and the listing date. In addition, our empirical results show that the first REIT IPO had a greater impact on funds transfer and that higher abnormal returns may be gained from investing in underpriced construction stocks during the period of REIT IPO issues.

Keywords： Taiwan, REITs, IPO, event study method, real estate stocks

1. Introduction

Studies have examined the relationship between public real estate stocks and the private real estate market. In particular, Giliberto (1990) and Lee, Lee and Chiang (2008) showed that REIT (real estate investment trust) returns may reflect the status of the private real estate market in the United States. Chen and Guo (2004) demonstrated the long-term relationship between construction stocks, the non-REIT real estate stocks in Taiwan (Liow and Sim, 2006), and private real estate performance in Taiwan. These studies show both REIT and non-REIT real estate stocks are linked to the real estate market.

Since REITs and non-REIT real estate stocks have a common link and are co-traded in the stock market, there may be a spillover effect between the two categories, such that developments in the market for REITs may attract the interest of investors in non-REIT real estate stocks and thereby influence the market for those stocks. If the market believes that REIT IPOs indicate a likelihood of prosperity for the real estate market, then REIT IPOs can also signal prosperity for the non-REIT real estate stocks. In contrast, if the market believes that the timing of an IPO coincides with the peak of the real estate market and indicates an over-valuation in real estate values, or that an IPO may trigger a transfer of funds with the these stocks, then the

IPO will have a negative effect on the non-REIT stocks.

Understanding how the returns of non-REIT real estate stocks are influenced by REIT IPOs helps real estate securities investors to make better investment decisions. However, the subject has not drawn much attention, except for relevant studies by Sing, Ho and Mak (2002) and Akhigbe, Johnston, Madura and Springer (2004). Sing, Ho and Mak (2002) studied the response of non-REIT real estate stocks to the issuance of REIT IPOs in Malaysia, and found that non-REIT real estate stocks show negative cumulative average abnormal returns after the announcement of REIT IPOs. Akhigbe, Johnston, Madura and Springer (2004) tested the signaling effects of REIT IPOs on other REITs and discovered that the other REITs also had negative cumulative average abnormal returns on the REIT IPO listing dates. Although Akhigbe, Johnston, Madura and Springer (2004) stated that REIT IPOs may also create signaling effects on non-REIT real estate stocks; they did not conduct further studies on the subject.

The current study extends the previous two studies to Taiwan REITs (T-REITs). The Taiwanese government began working on the Real Estate Securitization Statute in 2002 and announced its enactment on July 23, 2003. According to the stature, T-REITs can obtain funds for real estate investment through issuing beneficiary certificates, which are entitled to returns such as cash dividends.[1] As we know, there have not been

relevant studies so far on market signals associated with Taiwan REIT IPOs, and there also has been no literature describing the impact of REITs on non-REIT real estate stocks in Taiwan, since REITs are emerging investment products in Taiwan's capital market. More importantly, unlike their counterparts in Malaysia and the US, T-REITs has limited growth prospects since they can only constructed as closed-end funds and cannot issue additional units after IPOs (Ooi, Newell and Sing, 2006). This unique feature may make REITs compete less for investor funds with non-REIT real estate stocks in Taiwan than in Malaysia and the US. Therefore T-REIT IPOs may not have similar adverse effects on non-REIT stocks of Malaysian REIT IPOs in the extant study.

Sing, Ho and Mak (2002) did not examine the cause of differential responses of real estate stocks. Unlike their study, we applied the Event Study method to test the impact of REIT IPO events on construction stocks and to discover the specific reasons for construction stock generation of cumulative abnormal returns upon exposure of relevant news. Sing, Ho and Mak (2002) only examined the impact of an announcement of one REIT IPO on other real estate stocks. We performed a much broader study, examining reactions on all eight REIT IPOs that have taken place thus far in Taiwan. In order to accurately and thoroughly discuss the REIT IPO issuing

process, we explored not only the listing date event but also the signaling effects of filing approvals by the Financial Supervision Commission and the offering date.

In contrast to the findings in the Malaysian study, we found that a series of market signals, including the filing approval date, the public offering date and the listing date, all have a favorable impact on construction stocks. In addition, when narrowing down the variables that caused the cumulative abnormal returns in construction stocks, we found that the first REIT IPO in Taiwan led to a greater transfer of funds away from construction stocks, and that underpriced stocks showed a greater price increase during REIT IPOs.

In order to eliminate the distortion resulting from the stronger effect of the first REIT IPO of Fubon No.1 and to avoid mixed consequences from the different sectors that construction stocks belong to, we repeated the study while excluding the first REIT IPO of Fubon No.1 and classifying construction stocks into building stocks and real estate development stocks. Our findings showed that these two factors do not affect our results.

The structure of this paper is as follows. Section 2 introduces the empirical methods used, Section 3 describes the data, Section 4 presents and discusses the empirical results and Section 5 concludes the study.

2. Empirical methods

An Event Study is used to examine the response to REIT events. We use the event-parameter model to merge and simplify the estimation process in the traditional two-stage event study, which has been used by many researchers, including Thompson (1985), Binder (1985), and Sing, Ho and Mak (2002). This model is formulated as follows:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \sum_{s=t_1}^{t_2} \delta_{is} D_{s\tau} + \varepsilon_{it} , \qquad (1)$$

where R_{it} is the return on security i on day t. R_{mt} is the return on the Taiwan Stock Exchange Capitalization Weighted Stock Index (TAIEX) on day t. δ_{is} is the event parameter for dummy variable $D_{s\tau}$, which measures the abnormal returns during the event. Dummy variable $D_{s\tau}$ is the computed event window $\tau = [t_1, t_2]$, which is 1 for the event day and 0 for the other days. α_i is an intercept parameter; β_i is the traditional market coefficient for security i; ε_{it} is a mean with zero error term of security i on day t, which is not correlated with R_{mt} or $D_{s\tau}$. Following Lee and Lee's (2007) study in Taiwan, the estimation period was used to compute the expected returns from day $t = -120$ to $t = -31$ (where $t = 0$ is the announcement day).

For stock i, the cumulative abnormal returns (CAR_i) over the event window period $s \in [t_1, t_2]$ can be represented as follows:

$$CAR_i = \sum_{s=t_1}^{t_2} \delta_{is} \,. \tag{2}$$

The cumulative average abnormal returns ($CAAR$) for N stocks over an event window can be specified as follows:

$$CAAR_\tau = \frac{1}{N} \sum_{i=1}^{N} \sum_{s=t_1}^{t_2} \delta_{is} \,. \tag{3}$$

The variance of $CAAR_\tau$ is estimated by:

$$Var(CAAR_\tau) = \frac{Var(CAR_i)}{N} = \frac{1}{N(N-1)} \sum_{i=1}^{N} [CAR_i - \sum_{i=1}^{N} \frac{CAR_i}{N}]^2, \quad \tau = [t_1, t_2]. \tag{4}$$

The signaling effect from REIT events on construction stock returns is tested for significance by the t-statistic, defined as:

$$t_{CAAR} = \frac{CAAR_\tau}{\sqrt{Var(CAAR_\tau)}} \,. \tag{5}$$

The t-test for CAAR is used to test the null hypothesis that event announcements do not have any signaling effects of abnormal returns on construction stocks during the event window.

In addition, we analyze factors that influence the returns of construction stocks in response to REIT events. The variation in construction stock returns during the issued REIT IPOs is assessed by the following model:

$$CAR_{ij} = \alpha + \beta_1 MTB_{ij} + \beta_2 IPORETURN_j + \beta_3 EXCH_j + \beta_4 RELSIZE_{ij} \\ + \beta_5 MARKETUP_j + \beta_6 FIRST_j + \varepsilon_{ij} \tag{6}$$

where

CAR_{ij} = the CAR of construction stock i in response to the IPO event of REIT j.

MTB_{ij} =1, if the market-to-book value ratio of construction stock i at the previous quarter before the IPO of REIT j is less than 1; otherwise MTB_i =0.

$IPORETURN_j$ = percentage change between the offering price and the closing price on the first trading day for REIT j.

$EXCH_j$ =1, if REIT j is listed on the TSE (Taiwan Stock Exchange); otherwise $EXCH_j$ =0.

$RELSIZE_{ij}$ = the relative size of the construction stock i, measured as the market value of construction stock i relative to the market value of the REIT j.

$MARKETUP_j$ =cumulative returns in the Taiwan Stock Exchange Capitalization Weighted Stock Index portfolio from 100 days to 20 days prior to the IPO event of REIT j.

$FIRST_j$ =1, if REIT j is FuBon REIT No.1 (the first REIT in Taiwan); otherwise $FIRST_j$ =0.

ε_{ij} = an error term.

Vaidyanathan and Chava (1997) argued that a stock may be underpriced if its MTB is smaller than 1. If investors are attracted to construction stocks due to the announcement of REIT IPOs, then the undervalued stocks should have greater appreciation potential. In this case, we anticipate a positive value of MTB, i.e., lower-valued stocks should have greater cumulative abnormal returns.

IPORETURN here refers to a measure of REIT IPO returns on the first trading day. If the market sentiment conveyed by the performance of REIT IPO spills over to non-REIT real estate stocks, then there will be a positive relationship between IPORETURN and announcement-period returns of construction stocks (Akhigbe, Johnston, Madura and Springer, 2004). However, the higher the returns from the REIT IPO on the first trading day, the greater the number of investors who are attracted to

the REIT IPO, so that funds will be moved from construction stocks to the REIT, resulting in a negative relationship between IPORETURN and announcement-period returns of construction stocks (Lee, Lee and Chiang, 2008; Liziere and Satchell, 1997).

In addition, whether the REIT IPO opens on the TSE or GreTai Securities Market (GSM), the over-the-counter market in Taiwan, may have different effects on construction stocks (Akhigbe, Borde and Whyte, 2003). Institutional investors may be more attracted to listed REIT IPOs; therefore, the significance of the message conveyed by REITs may be more notable. On the other hand, OTC trading of a REIT IPO may result in a greater impact because the information delivered was formerly unclear to the market. Thus, we do not have prior opinions on the effect of EXCH.

RELSIZE is used to measure the size of construction stocks relative to that of the REIT IPO. If the size of the REIT IPO is smaller, then it will draw less attention and generate weaker market signals, and therefore it will have less impact on the re-evaluation of larger construction companies (Akhigbe, Borde and Whyte, 2003). However, a larger size of REIT IPO can have a greater dilution effect. In other words, increasing the supply of real estate stocks may lead to greater downward pressure on construction stocks (Akhigbe, Johnston, Madura and Springer, 2004). The Akhigbe, Borde and Whyte (2003) and Akhigbe, Johnston, Madura and Springer (2004) study

each supported one of these two predictions.

Finally, based on the research of Akhigbe, Johnston, Madura and Springer (2004), MARKETUP is used to estimate recent market sentiment. When the market sentiment is more favorable, investors may evaluate the issue information more optimistically. Thus, construction stocks may generate better cumulative abnormal returns. Furthermore, Akhigbe, Borde and Whyte (2003) stated that the first IPO usually has the strongest impact on revaluation in the same industry sector following a period of dormancy. The information delivered by REIT IPOs can be either the favorable prospects in the real estate market or the fact that investors expect the real estate market to have reached a peak and to enter a downward trend shortly. REITs and construction stocks can both be categorized as real estate stocks, yet their business activities are quite different. Thus, REIT IPOs can cause funds to be transferred away from construction stocks. In this case, we anticipate a significant coefficient on FIRST, which may be positive or negative, depending on the market interpretation.

3. Data

We adopted the daily stock return data from January 1, 2003 to October 31, 2007 for our analysis. We collected the returns and other firm information of all eight REITs as well as construction stocks from the Taiwan Economic Journal (TEJ), supplemented

by the Market Observation Post System (MOPS) of the Taiwan Stock Exchange. In addition, we obtained and confirmed the information on REIT IPOs from udndata.com. Lastly, we excluded data on construction stocks that had missing data during the study period.

There are presently eight publicly traded REITs in Taiwan. Fubon REIT No.1 was the first REIT introduced in the market by the Fubon Group, on March 10, 2005. Its public offering was oversubscribed by more than five times. The first REITs in Taiwan successfully attracted market attention to real estate securitization and created a remarkable foundation for the future REIT market. Nevertheless, REITs remain in the emergent stage in Taiwan. The eight currently traded REITs are presented in Table 1.

4. Empirical results

The empirical study was divided into two parts. The first part used the Event Study methodology to detect the response of construction stocks to the issue process of REIT IPOs. The second part sought to locate factors that affect the abnormal returns of construction stocks during the REIT IPO issue process.

Table 2 presents the cumulative abnormal returns generated from construction stocks during three REIT IPO events: the filing approval date, the public offering date

and the listing date. We examined two different time intervals, days (-1, +1) and days (0, +1), to capture the cumulative abnormal returns from the issue process of the eight REITs. As shown in Table 2, construction stocks enjoyed significantly positive abnormal returns in the three events. In particular, the public offering event was the most powerful signal, since the offering date was the day on which the public can purchase shares in the REIT, which naturally drew more attention from investors and the media. According to the events reported on udn.com, the frequency of reporting was greater on the offering date than on the approval date and listing date. Positive abnormal returns generated by three events imply that REIT IPO events deliver favorable messages. The outcomes were different from the findings of Akhigbe, Johnston, Madura and Springer (2004) and Sing, Ho and Mak (2002), which showed that the announcement of REIT IPOs in the US and Malaysia had a negative effect on other REITs and non-real estate stocks.[2]

Through the observation of returns during the three events on Table 2, we found some noteworthy results based on the fact that under the relevant regulation, the IPO must be offered to the public no later than 3 months[3] after approval by the Financial Supervision Commission. Correspondingly, it is possible to anticipate the dates of the public offering and issuance. However, there is no information on when the Financial

Supervision Commission will approve the application, which can be regarded as the main reason why interval $(0, +1)$ has more significant abnormal returns than interval $(-1, +1)$ for the filing approval event. Many news reports are issued after the filing is approved, and the maximum number of news reports is released on the date of the public offering, but news declines afterwards. News is only reported on the listing day, without much attention paid before or after that day. Therefore, the decreasing number of news reports and dearth of information may be the main reason why interval $(0, +1)$ has more significant abnormal returns than interval $(-1, +1)$ for the listing date event. These patterns are consistent with the notion that media coverage affects stock price reaction to information (Vega, 2006).

In order to determine which specific factors would cause different CAR of construction stocks in response to REIT IPOs, we perform a regression analysis[4]. Based on Akhigbe, Johnston, Madura and Springer (2004), we used the combined CAR of three events in Table 2 as the dependent variable. The combined CAR was the sum of the two-day $(0, +1)$ CAR of the filing date and listing date and the three-day $(-1, +1)$ CAR of the offering date. Equation (6) was estimated by weighted least squares (WLS)[5] to account for the possibility of heteroskedasticity in the error term. The outcome is shown in Table 3.

As expected, the MTB coefficient was positive and significant at the 1% level. This means that because of increasing attraction of investors to construction companies, the extent of price increase in underpriced construction stocks was significantly higher than others. The IPORETURN coefficient was positive but not significant. This finding was consistent with the research of Akhigbe, Johnston, Madura and Springer (2004), which showed that US REIT IPOs have similar effects on other REITs. Therefore, this empirical consequence was insufficient to support the idea that the market sentiments from REIT IPOs spill over to real estate stocks.

As shown in EXCH, there was no significant differential impact on construction stocks regardless of whether REIT IPOs were traded on the TSE or GSM. This finding is different from those of Akhigbe, Borde and Whyte (2003), who showed that the IPOs of industrial firms in NYSE and AMEX have greater impacts on rival firms than those in the OTC market. It is possible that trading on the TSE draws much attention, that trading on the GSM delivers information that was formerly unclear to the market and that these two factors offset each other. Additionally, because Taiwan has few REIT IPOs, only one of which is first traded on GSM, that particular REIT may draw greater market attention.

Additionally, unlike in previous studies, the size of construction companies relative to REIT IPOs had no differential effect on abnormal returns. The revaluation effect stated by Akhigbe, Borde and Whyte (2003) may have offset the dilution effect suggested by Akhigbe, Johnston, Madura and Springer (2004), leading to an insignificant coefficient for RELSIZE. Similarly, the MARKETUP coefficient was insignificant, which was inconsistent with the results and suggestions presented by Akhigbe, Johnston, Madura and Springer (2004). In other words, when the market sentiment was more favorable, construction stocks did not accumulate more cumulative abnormal returns on the announcement of REIT IPOs.

As anticipated, the FIRST coefficient was significant at the 1% level. However, in contrast to the studies by Akhigbe, Borde and Whyte (2003) that found the coefficient to be significantly positive, the FIRST coefficient in our study was significantly negative. Thus, either the first REIT IPO conveyed stronger but negative revaluation information to real estate, or it led to a greater funds-transfer effect on construction stocks. According to the circumstances, in which Fubon REIT No.1 was 500% oversubscribed, the presence of a remarkable negative coefficient for FIRST is likely due to the stronger funds transfer effect on construction stocks by the first REIT IPO in Taiwan.

In order to test the robustness of our results, we further analyzed the data by two different methods. Firstly, the data of Fubon REIT No.1 was excluded to avoid the distortion of our results by the stronger effects of the first REIT IPO. We only examined the response of construction stocks on the announcement of the seven other REIT IPOs. The results in Table 4 were similar to those in Table 2, except that the construction stocks had more significant abnormal returns on a three-day interval (-1,+1) for the listing date event, and the percentage of each positive CAAR in Table 4 was higher than that in Table 2. Table 5 reports the corresponding regression results.[6] As shown in the table, the MTB coefficient remained significantly positive. This indicates that although the information released by Fubon REIT No.1 was relatively stronger, our results in Table 3 are not driven by the first T-REIT IPO.

Secondly, we divided the Taiwanese construction industry, according to Zhang (2008), into two categories by their main business activities, i.e., building companies and real estate development companies. The former are contracted, model-based, OEM production and building-construction companies. The latter are real estate development companies that commission construction companies to build residential buildings or run a commercial building rental business.

In Table 6, the real estate development stocks appeared to accumulate more abnormal returns than did building stocks. The CAAR of building stocks was insignificant on the listing date event[7], while the positive CAAR in interval (0,+1) remained higher than in interval (-1,+1). The regression analysis presented in Table 7[8] shows that the two variables, MTB and FIRST, had statistical significance on real estate development stocks, while the effect of FIRST on building stocks was negative but not significant. We further examined the announcement effect of REIT IPOs on building stocks and real estate development stocks after excluding Fubon REIT No.1. As shown in Table 8, the results were similar to those in Table 4. Finally, Table 9 presents the results of the regression analysis on building stocks and real estate development stocks after excluding Fubon REIT No.1; the MTB variable remained steady and positively significant, similar to that shown in Table 5.

5. Conclusion

We performed a series of empirical procedures to determine whether the information in REIT events had an impact on the returns of publicly traded construction stocks. This was accomplished through a precise and detailed test of all relevant information in the process of REIT IPO issues. Contrary to the studies of Akhigbe, Johnston, Madura and Springer (2004) and Sing, Ho and Mak (2002) in the

US and Malaysia, we found that REIT IPOs signaled profit and prosperity in construction stocks.

Furthermore, we summed the CAR of construction stocks for the three events in the REIT IPO issue process as a dependent variable in order to determine the unique factors influencing construction stock returns through regression analysis. We hereby conclude that 1) the first REIT IPO of Fubon No.1 had a greater impact on funds transfer away from construction stocks; and 2) underpriced construction stocks may be a good choice for investment since they obtain more abnormal returns on REIT IPOs.

Table 1: The T-REIT list

Name of REIT	Listing Date	Property holdings	Scale
Fubon REIT#1	March 10, 2005	3 office and 1 retail buildings	8.09
Cathay REIT#1	October 3, 2005	1 hotel, 1 retail, and 1 office/ retail buildings	13.93
Shin Kong REIT#1	December 26, 2005	3 office and 1 retail buildings	11.3
Fubon REIT#2	April 13, 2006	3 office buildings	7.3
San-Ding REIT	June 26, 2006	1 office, 1 retail, and 1 warehouse buildings	3.85
Kee-Tai Star REIT	August 14, 2006	1 office and 1 hotel/office buildings	2.47
Cathay REIT#2	October 13, 2006	3 office buildings	7.2
Gallop REIT#1	May 15, 2007	3 office buildings	4.28

Note: 1. The data were obtained from the Market Observation Post System (MOPS). http://newmops.tse.com.tw/ 2. The scale is in NT billion dollars.

Table 2: Abnormal returns for construction stocks on REIT IPO events

Event	CAARs	% Positive
Panel A : Event windows on the filing approval date		
[-1,+1]	1.462	53.66%
[0,+1]	6.180***	78.05%
Panel B : Event windows on the offering date		
[-1,+1]	12.982***	87.80%
[0,+1]	8.933***	82.93%
Panel C : Event windows on the listing date		
[-1,+1]	3.009	65.85%
[0,+1]	4.068**	70.73%

Note: Abnormal returns are calculated as the differences between the actual and expected returns. Actual return is estimated as the daily return from the period t_{-1} to t_{+1}, where t_0 is the issuing date. The t-statistic tests the null hypothesis that the CAARs equal zero. **Significant at the 5 percent level. ***Significant at the 1 percent level.

Table 3: Regression analysis of construction stocks

Variable	Coefficient	VIF
Intercept	2.657	0
	(1.133)	
MTB	3.873***	1.137
	(4.102)	
IPORETURN	76.937	6.055
	(1.014)	
EXCH	-1.480	1.108
	(-0.838)	
RELSIZE	0.578	1.176
	(0.886)	
MARKETUP	0.112	3.864
	(0.644)	
FIRST	-10.981***	2.768
	(-4.412)	
Sample Size	336	
F-Value	20.759 ***	
R^2	0.274	

Note: The dependent variable is the sum of the two-day (0,+1) CAR of the filing date and listing date and the three-day (-1,+1) CAR of the offering date. Independent variables are as follows: MTB is the dummy variable and equals 1 if the market-to-book value of construction stock is less than 1; otherwise MTB is 0. IPORETURN is the percentage change between the offer price and the closing price on the first trading day. EXCH is a dummy variable and equals 1 if REIT IPO is listed in TSEC; otherwise, EXCH is 0. RELSIZE is the size of construction stocks relative to the market value of the IPO. MARKETUP is the cumulative return in Taiwan Stock Exchange Capitalization Weighted Stock Index portfolio from 100 days to 20 days prior to the IPO. FIRST is a dummy variable and equals 1 if the REIT IPO is the first ever launched in Taiwan; otherwise, FIRST is 0. T-statistics are in the parentheses. **Significant at the 5 percent level. ***Significant at the 1 percent level.

Table 4: Abnormal returns for construction stocks on REIT IPO events, excluding Fubon REIT No.1

Event	CAARs	% Positive
Panel A : Event windows for the filing approval date		
[-1,+1]	2.788	65.85%
[0,+1]	7.828***	80.49%
Panel B : Event windows on the offering date		
[-1,+1]	16.074***	95.12%
[0,+1]	10.876***	92.68%
Panel C : Event windows on the listing date		
[-1,+1]	5.807**	73.17%
[0,+1]	5.942***	85.37%

Note: Abnormal returns are calculated as the differences between the actual and expected returns. Actual return is estimated as the daily return from the period t_{-1} to t_{+1}, where t_0 is the issuing date. The t-statistic tests the null hypothesis that the CAARs equal zero. **Significant at the 5 percent level. ***Significant at the 1 percent level.

Table 5: Regression analysis of construction stocks, excluding Fubon REIT No.1

Variable	Coefficient	VIF
Intercept	2.562	0
	(1.135)	
MTB	4.666***	1.135
	(4.590)	
IPORETURN	84.511	3.864
	(1.197)	
EXCH	-1.533	1.085
	(-0.903)	
RELSIZE	0.916	1.174
	(1.255)	
MARKETUP	0.122	3.833
	(0.735)	
Sample size	294	
F-value	5.063 ***	
R^2	0.081	

Note: The dependent variable is the sum of the two-day (0,+1) CAR of filing date and listing date and three-day (-1,+1) CAR of offering date. Independent variables as follow: MTB is the dummy variable and equals 1 if the market to book value of construct stocks is smaller than 1; otherwise MTB is 0. IPORETURN is percentage change from the closing price to the offer price at the end of the first trading day. EXCH is the dummy variable and equals 1 if REIT IPO listed in TSEC; otherwise EXCH is 0. RELSIZE is the size of construct stocks relative to market value of the IPO. MARKETUP is cumulative return in Taiwan Stock Exchange Capitalization Weighted Stock Index portfolio to 100 days ending 20 days prior to the IPO. T-statistics are in the parentheses. **Significant at the 5 percent level. ***Significant at the 1 percent level.

Table 6: Cumulative abnormal returns for building stocks and real estate development stocks on REIT IPO events

Event	Building stocks		Real estate development stocks	
	CAARs	% Positive	CAARs	% Positive
Panel A : Event windows for the filing approval date				
[-1,+1]	5.189	70.59%	0.322	48.21%
[0,+1]	9.609***	88.24%	4.346**	68.33%
Panel B : Event windows on the offering date				
[-1,+1]	8.339***	70.59%	15.507***	93.56%
[0,+1]	5.671**	64.71%	10.943***	92.14%
Panel C : Event windows on the listing date				
[-1,+1]	1.340	64.71%	2.912	72.41%
[0,+1]	2.983	70.59%	4.182**	73.31%

Note: Abnormal returns are calculated as the differences between the actual and expected returns. Actual return is estimated with daily return from the period t_{-1} to t_{+1} where t_0 be the day of the issuing date. The t-statistic tests the null hypothesis that the CAARs equal zero. **Significant at the 5 percent level.***Significant at the 1 percent level

Table 7: Regression analysis of building stocks and real estate development stocks

Variable	Coefficient			
	Building stocks		Real estate development stocks	
	Coefficient	VIF	Coefficient	VIF
Intercept	5.561** (2.322)	0	-0.257 (-0.066)	0
MTB	4.400** (2.563)	1.056	3.498*** (3.711)	1.160
IPORETURN	0.340 (0.005)	6.046	109.965 (0.895)	6.071
EXCH	-3.460 (-1.665)	1.124	1.203 (0.433)	1.106
RELSIZE	0.242 (0.461)	1.086	0.974 (1.488)	1.183
MARKETUP	-0.044 (-0.379)	3.870	0.242 (0.801)	3.866
FIRST	-5.321 (-1.632)	2.769	-14.528*** (-3.507)	2.772
Sample size	136		200	
F-value	2.268***		26.954***	
R^2	0.095		0.456	

Note: The dependent variable is the sum of the two-day (0,+1) CAR of filing date and listing date and three-day (-1,+1) CAR of offering date. Independent variable as follow: MTB is the dummy variable and equals 1 if the market to book value of construct stocks is smaller than 1; otherwise MTB is 0. IPORETURN is percentage change from the closing price to the offer price at the end of the first trading day. EXCH is the dummy variable and equals 1 if REIT IPO listed in TSEC; otherwise EXCH is 0. RELSIZE is the size of construction stocks relative to market value of the IPO. MARKETUP is cumulative return in Taiwan Stock Exchange Capitalization Weighted Stock Index portfolio to 100 days ending 20 days prior to the IPO. FIRST is the dummy variable and equals 1 if REIT IPO is the first; otherwise FIRST is 0. T-statistics are in the parentheses. **Significant at the 5 percent level. ***Significant at the 1 percent level.

Table 8 Cumulative abnormal returns for building stocks and real estate development stocks on REIT IPO events, excluding FuBon REIT#1

Event	Building stocks		Real estate development stocks	
	CAARs	% Positive	CAARs	% Positive
Panel A : Event windows for the filing approval date				
[-1,+1]	4.276	70.29%	2.905	64.41%
[0,+1]	9.506***	76.47%	7.000**	80.22%
Panel B : Event windows on the offering date				
[-1,+1]	10.156***	88.24%	19.796***	96.54%
[0,+1]	7.486***	82.35%	12.849***	95.31%
Panel C : Event windows on the listing date				
[-1,+1]	4.474	64.71%	5.692**	80.74%
[0,+1]	4.909**	82.35%	6.053***	82.42%

Note: Abnormal returns are calculated as the differences between the actual and expected returns. Actual return is estimated with daily return from the period t_{-1} to t_{+1} where t_0 be the day of the issuing date. The t-statistic tests the null hypothesis that the CAARs equal zero. **Significant at the 5 percent level.***Significant at the 1 percent level

Table 9: Regression analysis of building stocks and real estate development stocks, excluding FuBon REIT No.1

| Variable | Coefficient | | | |
| | Building stocks | | Real estate development stocks | |
	Coefficient	VIF	Coefficient	VIF
Intercept	5.607** (2.274)	0	3.037 (0.754)	0
MTB	4.156*** (2.661)	1.068	6.219*** (5.408)	1.140
IPORETURN	1.530 (0.021)	3.840	80.832 (0.655)	3.858
EXCH	-3.472 (-1.619)	1.103	0.459 (0.154)	1.083
RELSIZE	0.030 (0.050)	1.090	0.097 (0.105)	1.174
MARKETUP	-0.037 (-0.309)	3.839	0.221 (0.739)	3.836
Sample size	119		175	
F-value	1.996*		6.694***	
R^2	0.081		0.165	

Note: The dependent variable is the sum of the two-day (0, +1) CAR of filing date and listing date and three-day (-1, +1) CAR of offering date. Independent variables as follow: MTB is the dummy variable and equal 1 if the market to book value of construction stock is smaller than 1; otherwise MTB is 0. IPORETURN is percentage change from the closing price to the offer price at the end of the first trading day. EXCH is the dummy variable and equal 1 if REIT IPO listed in TSEC; otherwise EXTH is 0. RELSIZE is the size of construction stocks relative to market value of the IPO. MARKETUP is cumulative return in Taiwan Stock Exchange Capitalization Weighted Stock Index portfolio to 100 days ending 20 days prior to the IPO. T-statistics are in the parentheses. **Significant at the 5 percent level .***Significant at the 1 percent level

Endnotes

[1] Important regulations of the Real Estate Securitization Statute on dividend payout policies, financial structure and other areas of interest are summarized as follows: a) at least 75% of the asset value of a REIT must be composed of bank deposits, government or financial bonds, treasury bills, and negotiable certificates of time deposits, while the proceeds derived from the REIT investment, which are to be distributed pursuant to the REIT contract, must be distributed within six months after the end of each fiscal year.; b) REIT Funds must be Closed-End Funds; c) REIT investment in securities should not exceed 40% of its assets or NT$6 million; d) the trust property's rent and lease terms are not subject to existing laws; e) real estate investment trusts are organized as contract systems, that is, special-purpose trusts; and f) the Trustee cannot issue additional beneficial securities.

[2] In Akhigbe, Johnston, Madura and Springer (2004), non-IPO REITs did not have significant negative cumulative abnormal returns on the filing date.

[3] Article 14 of the Real Estate Securitization Statute.

[4] Of eight REIT IPOs in Taiwan, five were issued by Financial Holding Corporations (FHC). We created a dummy to indicate if an REIT IPO is issued by a FHC. The dummy was not significant in the regression models. Furthermore the inclusion of the dummy did not affect the results of this study.

[5] We follow the the estimation procedure of WLS stated in Wooldridge (2006, p. 292) to correct heteroskedasticity.

[6] Similar regression results were obtained when the two-day (0,+1) CAR of filing date and the three-day (-1,+1) CAR over the offering date and listing date are summed over as the dependent variable.

[7] When four construction companies specifically commissioned for public works are excluded, the results were similar to those in Table 7.

[8] The regression results are similar when the two-day (0,+1) CAR of filing date and the three-day (-1,+1) CAR over the offering date and listing date are summed over as the dependent variable.

References

Akhigbe, A., S.F. Borde, and A.M. Whyte. Does an industry effect exist for initial public offerings? *The Financial Review*, 2003, 38:4, 531-551.

Akhigbe, A., J. Johnston, J. Madura, and T.M. Springer. Market signals associated with REIT IPOs. *Journal of Real Estate Finance and Economics,* 2004, 28:4, 355-367.

Binder, J.J. Measuring the effects of regulation with stock price data. *The Rand Journal of Economics*, 1985, 16:2, 167-183.

Chen, M.C., and C.J. Guo. An analysis of long-term performance of Taiwan property stock comparative study of direct and indirect property investment. *Management Research*, 2004, 4:2, 144-168.

Giliberto, S.M. Equity real estate investment trusts and real estate returns. *Journal of Real Estate Research*, 1990, 5:2, 259-263.

Lee, M.-L., M.-T. Lee, and K.C.H. Chiang. Real estate risk exposure of equity real estate investment trusts. *The Journal of Real Estate Finance and Economics*, 2008, 36:2, 165-181.

Lee, M.-L., and M.-T. Lee. Corporate real estate sales agency costs of managerial discretion. *Property Management*, 2007, 25:5, 502-512.

Liow, K.H. and M.C. Sim. The risks return profile of Asian real estate stocks. *Pacific Rim Property Research Journal*, 2006, 12:3, 283-310.

Liziere, C. and S. Satchell. Interactions Between Property and Equity Markets: An Investigation of Linkages in the United Kingdom 1972-1992. *Journal of Real Estate Finance and Economics*, 1997, 15:1, 11-26.

Ooi, J.T.L., G. Newell and T.-F. Sing. The growth of REIT markets in Asia. *Journal of Real Estate Literature*, 2006, 14:2, 203-222.

Sing, T.F., K.H.D. Ho and M.F. Mak. Real estate market reaction to public listings and acquisition news of Malaysian REITs. *Journal of Real Estate Portfolio Management*, 2002, 8:3, 209-227.

Thompson, R. Conditioning the return-generating process on firm-specific events: a discussion of event study methods. *The Journal of Financial and Quantitative*

Analysis , 1985, 20:2, 151-168.

Vaidyanathan, R. and S. Chava. Stock returns and price to book ratio. *ICFAI Journal of Applied Finance,* 1997, 3:2, 45-53.

Vega, C. Stock price reaction to public and private information. *Journal of Financial Economics* , 2006, 82:1, 103-133.

Wooldridge, J.M. *Introductory Econometrics: A Modern Approach*, 2006.

Zhang, Z.Y. Industry that is restricted for growth-forecasting property industry under regulation in Taiwan. *Professional Engineer Journal*, 2008, 50, 10-15.