

EVENT STUDY OF SUCCESSFUL LAND TENDERS: SINGAPORE'S EVIDENCE FROM 2003 TO 2010

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ABSTRACT

This paper adopts the event study methodology in examining the market reaction of the stock price of the winning tenderer from the announcement of the tender win. The companies studied are those listed in the Singapore Stock Exchange (SGX) during the period between 2003 and 2010. The findings from the study show that land tender win announcements resulted in positive abnormal return for the winning companies' stock prices. The underlying factors which are responsible for the positive abnormal return are the level of experience of the winning tenderer, level of uncertainty of the development, number of participating bidders and the type of land zoning for the site. On the other hand, a negative relationship is observed between the bid margin and the abnormal return. The higher the margin, the lower the return will be.

Keyword: Event study, government land sales, tender, stock price, abnormal returns.

INTRODUCTION

Real estate development is a highly creative endeavour where the physical ingredients such as land and buildings are effectively combined with financial resources and professional skills to create a built environment for the people to live, work and play. The process usually begins with the acquisition of a site. About ninety percent of the land in Singapore is owned by the government and one major source of land supply for real estate developers is through the government land sale (GLS) programme. The release of land by the government is made in a steady manner so as to ensure that the needs of the society like housing, commercial and industrial development are adequately met. Land parcels under the GLS programme are typically sold on a leasehold tenure of 99 years.

Land acquisitions made by the listed firms will directly affect their shareholder's wealth. The response of the shareholders on the successful land acquisitions can be observed through the movement of the stock prices when the announcements are made. If investors expect the development to generate positive net present value (NPV), there will be an increase in the stock price of the company. If not, then stock price is expected to be constant or decline.

The objective of this paper is to examine the market reaction following the announcements of successful land tender bids by property companies listed on the Singapore Stocks Exchange (SGX) using the event study methodology. In addition, the study also seeks to understand the factors that explain the existence of the abnormal return, if any arises.

This paper differs from Ooi and Sirmans (2004) as it considers a timelier window period and the impact of a series of different important events which have affected the real estate market in Singapore. Ooi and Sirmans (2004) used a study period from the first quarter 1990 to the second quarter 2002, while this paper adopted a period from the first quarter 2003 to the fourth quarter 2010. During the study period of this paper, there is a recent increase of inflow foreign companies which participated in Singapore's government land sale tenders, as well as the onset of the global financial crisis in 2007.

LITERATURE REVIEW

Acquisition and disposal of property

The acquisition and disposal of land and buildings are part of the strategies that are used by Real Estate Investment Trusts (REITs) and companies to increase their share prices and seek faster growth. There are positive returns whether these firms are the buyers or the sellers (Allen and Sirmans, 1987; Hite *et al.*, 1984). This is due to the tax benefits that are associated with real estate and organizational advantages.

On the other hand, Glascock *et al.* (1991) found that firms that engaged in acquisition of real estate assets do not experience positive abnormal return. This means that there is no value enhancement for the buyers as most, if not all of the wealth that exists will be effectively captured by the sellers. It would be expected that in a competitive land market, there will be little or no significant wealth effects that will be enjoyed by the successful tenderers upon the announcement of the land tender win. These findings differ because of the different sampling of firms selected for their studies. Allen and Sirmans (1987) and Hite *et al.* (1984) used a sample which focused primarily on property firms, while Glascock *et al.* (1991) studied the acquisition and disposal of real estate assets by non-property firms from year 1981 to 1986.

In an earlier study on government land sale programme in Singapore, Ooi and Sirmans (2004) use a unique set of public auction data. Their analysis shows that there exist positive excess returns associated with the announcements of successful land acquisition. The study also revealed that excess return is positively related with the ability of the successful bidder to create value from the development process. In addition, it is found that the level of uncertainty related to a development site is also an important factor that determines the magnitude of the abnormal return with the greater the uncertainty, the higher the abnormal return. However, abnormal return is

found to be inversely related to the winning firm engaging in non-wealth maximization activities.

Real estate auctions are a popular method of selling residential and commercial properties, as well as government land sites in Hong Kong. Ching and Fu (2003) applied event-study methodology to government land auctions in Hong Kong. They found that the developers are able to gain *ex ante* profits at land acquisition. They also showed that the expected abnormal return increases with the site value and the government land disposal level but decreases with the property market liquidity.

Chau *et al.* (2010) examined two types of market responses to unexpected land auction outcomes. Their results confirm both the market-wide effect and local neighborhood effect. In other words, unexpected land auction outcomes contain information that affects property prices in the secondary real estate market.

More recently, Tse *et al.* (2011) examined the effects of prevailing market sentiments in real estate markets and the presence of winner's curse in land auctions in Hong Kong. The findings support the notion that winner's curse does exist and affect the bidding strategy of the developers and that signaling plays a crucial role in the way the stock market sentiment develops on the land auction outcome.

Wealth effects of acquisition and mergers

The introduction of REITs has provided investors with an opportunity to acquire and include real estate assets as part of their investment portfolios without having to physically own the property and is burdened by the trouble of the day-to-day management of the property. REITs complement the investment environment by providing better diversification to the investors' existing investment portfolios (Ooi *et al.*, 2006).

Campbell *et al.* (2003) examined a sample of 209 REIT portfolio acquisitions during the period between the period of 1995 and 2001 and found that there are significant positive abnormal returns to REIT shareholders around the announcement date. Similarly, positive abnormal return with regards to REITs' acquisition and dispositions announcements is found in the study period of twelve-year from 1994 to 2005 (Price, 2009). The results show that abnormal return of 0.09% was realized on the day of announcement. There was a more pronounced return of 0.25% abnormal return on REITs over the three-day announcement window (D-1, D0 and D+1) of property dispositions.

From the corporate real estate perspective, event studies have been applied to examine the stock price reactions to the announcements of real estate disposals and acquisitions. Ting (2006) found evidence of different wealth effects for Malaysian listed non-property companies when they announce property disposals under different

economic conditions. For the buoyant period, the results show a significantly positive response to the announcement of property disposals. But negative wealth effects are felt when property disposals were announced during the recession periods. Similarly, Ting (2007) found that significantly positive stock price reaction to property acquisition announcements for the pre-crisis period. However, for the post crisis period, there is a negative effect for the shareholders' wealth.

DATA COLLECTION AND RESEARCH METHODOLOGY

The sample selection process began with the compilation of the data pertaining to the events of GLS tender announcements. The information such as the government agency responsible for the sale of the site, date of tender launch, date of closing and date of the award were collected along with the relevant site information and name of the successful tenderers were also taken down. These data can be obtained from the Urban Redevelopment Authority (URA) and Housing and Development Board (HDB).

Next, a background study of the winning tenderers was conducted to identify the true identity of the bidder. This is because the GLS programme requires the bidding companies to submit their bids through a separate company. The parent companies are then categorized into either private or public listed corporations after the verification. Since the event study methodology can only investigate the effect of the announcements on the stock prices of the companies, those tenders which are won by private companies would subsequently be omitted in the analysis.

The raw data collection resulted in finding 138 development sites sold during the period between 2003 and 2010. The total selling price of the development sites amounted to SGD \$28.25 billion. Land sales for places of worship, heavy vehicle parks, petrol stations, car showrooms, nursing homes, and development sites that are categorized as others were excluded from the study, as the small sale prices are unlikely to have any significant impact on the stock prices of the winning companies. After the data filtration, the final sample size is reduced to 46 bidding events. Of these 46 events, 35 sites were designated for private residential development, 6 for commercial development, 4 for industrial development and 1 is designated as white site development. Land that is zoned 'white' can be put to various uses including hotel, retail, office and residential space. The objective is to provide developers the flexibility in deciding the mix of uses on this land parcel in response to changing market conditions. However, any change of use should not exceed the original gross floor area of the whole development.

The total value of the final sample of 46 sites is SGD \$10.56 billion which constituted about 38 percent of the total GLS sales. As the sample sale value constituted quite a significant proportion of the total selling price, it is taken that the study sample is sufficiently large to be a representative of the GLS auction bidding behaviour.

Table 1: Development sites sold by URA and HDB through GLS program from 2003 to 2010

Year	No. of development sites sold			Sale price SGD millions
	URA	HDB	Total	
2003	3	0	3	\$447.68
2004	2	1	3	\$112.10
2005	8	2	10	\$2,184.32
2006	11	1	12	\$1,925.39
2007	27	8	35	\$9,232.44
2008	16	5	21	\$3,084.57
2009	9	3	12	\$1,743.82
2010	22	20	42	\$9,521.32
Total	98	40	138	\$28,251.65

*The data excludes the land sale of places of worship, petrol stations, car showrooms, nursing homes, heavy vehicle park and others.

Table 2: Company's name and the number of land tender win during the period from 2003 to 2010

Company's name	Number of land tender win
Sim Lian Group Limited	9
Fraser's Centrepoint Limited	6
Chip Eng Seng Corporation Limited	5
City Development Limited	4
Wing Tai Holdings Limited	2
Wee Hur Holdings Limited	2
UOL Group Limited	2
Keppel Land Limited	2
Allgreen Properties Limited	2
Capitaland Limited	2
Tuan Sing Holdings	1
Low Keng Huat (Singapore) Limited	1
United Engineering Limited	1
MCL Land Limited	1
Guthrie GIS Limited	1
Pan Pacific Hotels Group Limited	1
Ho Bee Investment Limited	1
Hotel Grand Central Limited	1
Kim Eng Holdings Limited	1
Fragrance Group Limited	1
Total	46

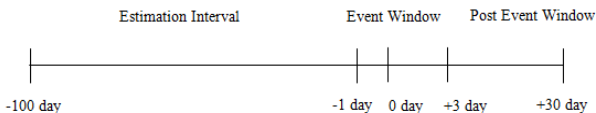
Event study methodology

This paper adopted the methodology developed by Fama, Fisher, Jensen and Roll (1969) called event study methodology in investigating the effect of announcement of land tender win on the stock prices of winning companies. The data on the stock prices of these companies before and after the announcements will be gathered and analyzed. The change in stock prices that is beyond expectation, abnormal return, during the event window will be noted and will be attributed to the effects of the event. The event will be said to have an impact on the stock price of the companies if there is a significant abnormal return found during the event window.

One of the key assumptions of this methodology is that the market is efficient. Therefore, any effects arises from the event will be reflected immediately in the stock prices of the companies. Following the event study methodology, the study utilised the multivariate regression model (MVRM) which is applied to the cumulative abnormal return (CAR) to investigate the possible explanation for the abnormal return from the list of variables.

The first step in carrying out the event study is to decide on the event of interest which in this case is the announcement of the land tender win, and also the window period to carry out the examination of the security prices of the winning firms. The window period selected is similar to that in Ooi and Sirmans (2004) where an estimation window of -100 days to +30 trading days was employed. As shown in Figure 1, abnormal returns are examined over a window of five consecutive trading days around the event (-1, 0, +1, +2, +3 days) with the closing date of the land auction designated as day 0. Although the official award of the site is on the date of award, the date of closing is the day where the news of top bidder of the site is announced publicly, The top bidder would typically be awarded with the site unless the bidding price happens to be below the reserved price.

Figure 1: Estimation and event period



According to Bowman (1983), we would expect that the direction of the security would differ in accordance to the information relevant to the event. A model could also be developed to partition firms into expected positive and negative price reaction. It is thus hypothesised that:

$$E(e_{it} | \eta, y_{it}) \neq E(e_{it}) = 0 \quad (1)$$

where:

e_{it} = measure of excess returns in firm i in time period t ,

η = expectation model

y_{it} = information from η for firm i and time t

The market index adopted for this study is the Singapore-All-Shares Index where it comprises all of the stocks listed on the Singapore Exchange. The daily returns for the market index and the individual securities were obtained from DATASTREAM.

The excess return or the prediction error (γ_{ek}) for the corresponding day is estimated:

$$R_{jt} = \alpha_j + \beta_{mt} + \sum_{k=1}^{K_j} \sum_{e=-1}^1 \gamma_{ek} D_{ek} + \varepsilon_{jt} \quad (2)$$

where:

R_{jt} = rate of return on security j at time t

R_{mt} = rate of return on the Singapore-All-Share Index at time t

α_j = OLS estimate of intercept term

β_j = OSL estimate of the slope term (systematic risk)

ε_{jt} = residual error of i.i.d. normal distribution with a zero mean and a constant variance.

K = the number of events included in the estimation

D_{ek} = dummy variable (0 for all the dates and 1 on the e th day of the k th event window)

Similar to Ooi and Sirmans (2004), the test of the significance of the abnormal returns is made through the use of J_1 and J_2 statistics for the e th day of all the event windows. The details of the J_1 and J_2 statistics can be found in Campbell *et al.* (1996):

$$J_{1,e} = \left(\sum_{i=1}^W \sum_{k=1}^{K_j} \sigma_{ei}^2 \right)^{-\frac{1}{2}} \sum_{i=1}^W \sum_{k=1}^{K_i} \gamma_{eki} \quad (3)$$

$$J_{2,e} = N^{-\frac{1}{2}} \sum_{i=1}^W \sum_{k=1}^{K_i} \frac{\gamma_{eki}}{\sigma_{eki}} \quad (4)$$

where:

σ_{eki} = standard error of the abnormal return estimate γ_{eki} .

Our data sample consists of 46 estimation equations ($W = 46$) and 46 events. Under the null hypothesis that the abnormal returns follow a zero-mean normal distribution, J_1 and J_2 statistics have an approximate standard normal distribution.

DATA ANALYSIS

Announcement effects of successful bids

As shown in Table 3, the highest abnormal return was achieved on day +1, in which the gain recorded was 0.780 percent and is found to be statistically significant using the J statistic at a 2 percent significant level or higher. On the average, the gains recorded for day -1 is -0.272 percent, -0.163 percent on the event day, +0.433 percent on day +2 and 0.035 percent on day +3. However, the abnormal returns for the day -1, 0, +2 and +3 were found to be poorly significant. The mean cumulative average abnormal return (CAR) for window period (0, +3) was given as 1.015 percent. The highest incidence of positive abnormal returns occurred on day +1 at 56.5 percent with the second highest incidence of positive abnormal returns registered on day +2 at 54.3 percent. On the other hand, the highest incidence of negative abnormal returns was recorded on day -1 at 58.7 percent. Overall, the results of the event study indicate that most of the announcement effect is significantly captured on the day after the event.

Table 3: Average and median abnormal returns to successful firms within event interval (-1, 3) for a sample of 46 tender winning announcements

		Day of event window				
		-1	0	+1	+2	+3
Sample mean (%)		-0.272	-0.163	0.780	0.433	-0.035
Sample median (%)		-0.05	0.1	0.2	0.1	0.1
Standard deviation (%)		1.836	1.663	1.866	2.096	1.616
Percentage positive (%)		41.3	52.2	56.5	54.3	43.5
J ₁ Statistic		-0.854	-0.512	2.454	1.360	-0.109
J ₂ Statistic		-1.427	-0.308	2.516	1.072	-0.377

Figure 2: Graph of the abnormal return behaviour within event interval

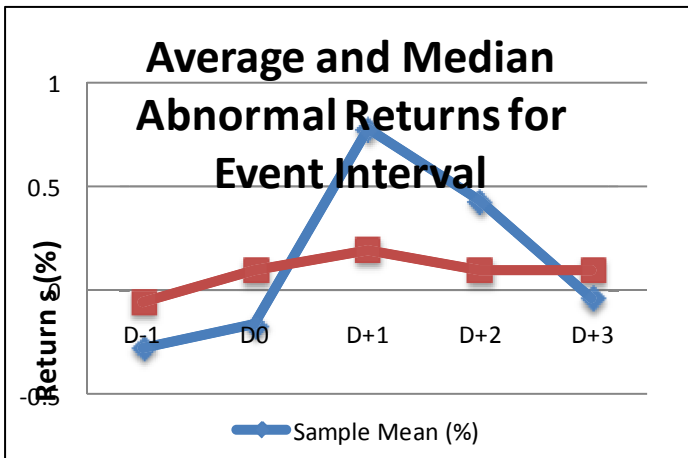


Figure 2 shows clearly that the wealth effect of the announcement of land tender win is successfully captured during the first and second day after the event day. Contrary to the findings in Ooi and Sirman (2004) which found that the largest proportion of the wealth effect is present on the event day itself and is highly significant, this study found that the abnormal return on the day 0 is actually negative and is insignificant. One possible explanation is that the announcement of the highest bid on the closing date is made at between 4 pm and 5 pm when the Singapore Stock Exchange's trading time ends. Hence, the actual response to the announcement will only be reflected on the subsequent trading day.

In sum, the winning bidders for the GLS sites reaped positive abnormal returns. Although the effect of these returns occurred on day +1 and day +2, the overall return is found to be +0.743 percent. This suggests that the winning tenderers were bidding in a fashion that enabled them to capture the wealth effects and also is able to avoid the ill effects of excessively high bids resulting in the winner's curse.

Multivariate regression analysis

Risk and uncertainty are part and parcel of a real estate development. However, the level of risk in a certain development project may vary greatly in comparison with other development project due to the complexity in the design specifications, or severe physical site constraints, or due to onerous contractual conditions specified in the auction document. Thus, we are interested to examine the likely determinants of the abnormal returns associated with land acquisition.

A multivariate regression model (MVRM) is applied to the cumulative abnormal return (CAR) to help investigate the possible explanatory factors for the existence of the abnormal return. The CAR is used due to the possibility that the market may not be efficient enough to react instantaneously on the announcement of the event. As the announcement effect may spread out over a long period of time, it more suitable to use the CAR as an indicator of the existence of abnormal return.

The equation for the MYRM is given below:

$$CAR = \alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_z X_z + \varepsilon \quad (5)$$

where:

CAR = cumulative abnormal return for the period (-1, +3)

X_1, X_2, \dots, X_z = explanatory variable

α = constant term

$\beta_1, \beta_2, \dots, \beta_z$ = regression coefficient

ε = random error

A set of explanatory variables have been chosen and they are defined in Table 4.

As shown in Table 5, the first explanatory variable shows a negative sign which implies that companies that have real estate as their core business produced a negative abnormal return as compared to those which are non-real estate focus. This finding differs from that in Ooi and Sirmans (2004), which yielded a positive result for property-focused companies. It appears that the focus of the company's business is not as important as the track record and experience of the company. For example, some multi-industry firms like Tuan Sing Holdings and Guthrie GTS Limited are involved in several types of business activities, but they also managed to achieve high returns in property development.

Table 4: Summary of explanatory variables for the sample of 46 land auctions in Singapore

Variable	Definition	Mean	Standard deviation
Property focus	Dummy variable equal 1 if the winning bidder's main business focus is real estate and 0 otherwise.	0.867	0.344
Tender duration	Number of months given to auction participants to complete due diligence and submit tender.	1.633	0.625
GLC	Dummy variable equal to 1 if winning bidder is a Government-linked company (GLC), 0 otherwise.	0.089	0.288
Sale agency	Dummy variable equal to 1 if the sale of site is handled by URA, and 0 otherwise.	0.533	0.505
Bid margin	Dummy variable equals to 1 if the ratio of the second highest bid to the highest bid is smaller than 0.85, and 0 if higher than 0.85.	0.200	0.405
No. of bidders	The number of bidders in each tender	7.000	4.123
Residential	Dummy variable equals to 1 if the land parcel is zoned for residential use, 0 if otherwise.	0.778	0.420
Commercial	Dummy variable equals to 1 if the land parcel is zoned for commercial use, 0 if otherwise.	0.111	0.318
Industrial	Dummy variable equals to 1 if the land parcel is zoned for industrial use, 0 if otherwise.	0.089	0.288
White Site	Dummy variable equals to 1 if the land parcel is zoned as white site, 0 if otherwise.	0.022	0.149
Tender year	Dummy variable equals to 0 if the land acquisition is made on year 2008, 1 if otherwise.	0.911	0.288

Table 5: Regression estimates of day 1 abnormal returns and characteristics of the sample of land auctions in Singapore

	Coefficient	Standard error	t Stat	Significance
Property focus	-0.012	0.010	-1.237	0.225
Tender duration	0.004	0.006	0.0656	0.516
GLC	-0.008	0.011	-0.774	0.444
Sale agency	0.006	0.007	0.843	0.405
Bid margin	-0.004	0.009	-0.452	0.654
No. of bidders	0.001	0.001	0.790	0.435
Residential	-0.002	0.013	-0.169	0.867
Commercial	0.020	0.027	0.713	0.480
Industrial	-0.014	0.016	-0.844	0.405
White site	0.011	0.023	0.491	0.626
Tender year	-0.012	0.011	-1.112	0.274
	R Square	0.244		
	Adjusted R Square	0.022		
	F-value	1.098		
	Observations	46		

Where the winning firm is a government-linked company (GLC), the regression results show that they are consistent with the findings in Ooi and Sirmans (2004), where GLCs have lower returns in comparison with other publicly listed companies. They may be obliged to spearhead strategic projects that are of national interests and possibly require a longer payoff period. As this obligation does not align with maximizing the profit in the best interest of the shareholders, the land acquisitions made by GLCs are received less favourably in the stock market.

The bid margin shows a negative figure when the ratio between the highest and the second highest bids are smaller than 0.85. This means a bid differential that is more than 15% from the highest bid will result in unfavorable stock price reaction for the winning bidder. Over-bidding for the development land inevitably means that the stock price will more likely be adversely affected as the market perceived overpaying as a cut into the firm's profit. On the other hand, the number of tenderers that bid for the land yields a positive coefficient. This implies that with more companies bidding for the piece of land, the winning firm would enjoy a higher abnormal return of 0.1% increment for each increase in the number of bidder. The reason is that a land parcel that draws more bidders means that it is an attractive and highly desirable site to acquire.

Overall, the regression model has an R-square value of 0.244, which is not a strong fit as this indicates that only 24.4% of the changes in the abnormal return on D+1 are explained by the set of chosen explanatory variables. All the coefficients are also

found to be insignificant. Hence, there could other significant determinants which are not included in the model. They should be identified in further studies and included for analysis.

CONCLUSIONS

Property firms need land to carry out their primary activities. It is thus expected that land acquisitions made by these firms will directly affect their shareholder's wealth. The response of the shareholders on the successful land acquisitions can be observed through the movement of the stock prices when the announcements are made. Event study provides a useful tool to measure the effects of an economic event on the value of the firms. This research methodology exploit the fact, given rationality in the marketplace, the effects of an event will be reflected immediately in stock prices.

The results from the study found that land tender win announcements do result in positive abnormal return on the winning companies' stock prices. The underlying factors which are responsible for the positive abnormal return as found in this paper are the level of experience of the winning tenderer, level of uncertainty of the development, number of bidders participated in the bidding and type of land zoning for the site. On the other hand, negative relationship is observed between the bid margin and the abnormal return.

This study further reinforces the findings of Ooi and Sirmans (2004) that significant positive abnormal return exists for the winning companies that are successful in acquiring land from the Singapore's government land sale programme.

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