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WARRANT SEOS IN AN EMERGING MARKET: EVIDENCE FROM THAILAND

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ABSTRACT

Eckbo et al. (2006) point out that Seasoned Equity Offering (SEO) companies need to concern for flotation costs, both of direct and indirect, when issuing newly shares. Previous literatures (i.e. Burton et al., 1999; Masulis and Shivakumar, 2002; Corwin, 2003; and Walker and Yost, 2007), considered mainly stock price reaction and underpricing mostly in the U.S. and other developed markets. In contrast, there is paucity of literature on SEOs in Asian markets. The purpose of this paper is to extend our empirical works on Seasoned Equity Offering (SEO) in Thailand, particularly on the areas of stock price reaction and the post-issuing performance. Instead of common stock offerings, we identified 47 firms (of 173 SEO companies) issuing newly shares via warrants between 1999 and 2006. We found that there is a negative reaction of stock prices to SEO announcements. This outcome is consistent to our prior research on common stock issuing companies. With warrant issuing, the SEO firms are impacted by the offering dilution, in comparison with those issuing via common stocks. As these preliminary consequences in the first context, we propose to pay more attention in order to examine the post-issuing performance of warrant SEO firms.

Keywords: Warrants, SEO, Stock Price Reaction, Thailand, Event Study

INTRODUCTION

Since equity offerings (via common stocks) lead to the possibility of the occurrence of dilution, issuing firms can reduce this danger by issuing warrants, giving shareholders the right to buy stocks back when they believe that it is the right time (exercise warrants). Regarding our SEO sample of 173 Thai companies during the period 1999 to 2006, more than 25% of these firms issued new shares by warrants, instead of common stocks. Warrants, together with right issuing and private placement, are one of the three popular issuing methods, and several listed companies on the Stock Exchange of Thailand (hereafter: SET) have recently shown a preference for these.

Eckbo et al. (2006) indicate that although there is no resolution on the issue of a security announcement (which remains inconclusive in the area of an expected flotation cost), a decline in the issue price may be the outcome of a typical negative announcement effect. Nevertheless, the arguments of much literature in this area (e.g. Asquith and Mullins, 1986; Denis, 1994; Corwin, 2003; Walker and Yost, 2007) focus on common stock offering in developed markets. Hence, we propose to investigate something different: warrant SEOs in an emerging market (Thailand). Our study can claim to be the first paper to examine a relevant period in this area in the ASEAN region, with a focus on Thailand. This leads to our motivation to have more knowledge of whether evidence of the common stock issuing firms is consistent in warrant issuing companies.

The paper is organised as follows: section 2 will discuss the relevant literature and hypotheses. Section 3 will clarify the data and methodology, followed by the empirical results in section 4. The investigation is concluded in section 5.

LITERATURE REVIEW AND HYPOTHESES

Literature on Warrant Issuing

Two similar securities can be utilised for issuing new shares apart from common stocks. These are warrants and convertible bonds. Several studies in this area, especially in developed markets (e.g. the U.S.), mainly focus on convertible bonds, as they can be publicly issued, cannot be sold separately and can be issued with other securities. We begin with the study by Singh et al. (1991), who compare underwritten and non-underwritten convertible bond calls that have an effect on stock price. Their results demonstrate that a small portion of the negative average stock price reaction to underwritten calls can only be explained by the direct costs of using underwriters (Singh et al., 1991, p.193). Stein (1992) shows that some factors regarding convertible issues are consistent with the theory: i.e., the negative announcement effect is normally caused by issuing convertible bonds rather than equities.

The utilisation of warrants in initial public offerings (IPOs), Dunbar (1995, p.76) shows that when warrants are issued to compensate an underwriter, the offering costs are effected negatively and lead to a minimisation of costs. A similar examination made by Chemmanur and Fulghieri (1997) shows that the firm insider is allowed to obtain underpricing in order to reduce the costs of maintaining equity after a risky IPO. Subsequently, warrants are included in the issue package. Due to the lower coupon rate, Billingsley and Smith (1996) argue that convertible bonds are chosen when the potential dilution increases and there is a negative reaction from stockholders. According to blue sky regulation, Ng and Smith (1996, p.380) clarify that when firms have high return volatility, a high rate of expected stock price appreciation and substantial growth opportunity, it may be pointless to utilise warrants.

Lewis et al. (1998) examine how convertible bonds are designed by a firm's managers. Their paper shows that the shorter the call protection period, the more managers gain the private information. Moreover, there are reductions in the expected costs of financial distress and the high negative common stock announcement effects when issuing convertible bonds (Lewis et al., 1998, p.39). Mayer (1998) suggests that a sequential financing problem can be resolved by applying the convertible feature. In addition, the exercise of real investment options should be financed in order to complete the convertible bond contract (Mayer, 1998, p.101). Examining the hypothesis of sweetens debt issues; Mann et al. (1999) indicate that the choice of convertible debt has no relationship with the level of volatility in the equity market. In addition, convertible debt is more preferable when there is an increase in interest rates and when there is a bull market (Mann et al., 1999, p.105).

Concerning examination of the signalling hypothesis, Ederington and Goh (2001, pp.470-471) reject this because: (1) there is an accumulation of equity in the accounts of calling firm managers and (2) an increase in purchasing surrounding the calling months. Lewis et al. (2001, p.466) examine all domestic convertible debt in the U.S. between 1979 and 1990, and claim in their findings that convertible debt is preferred by issuers to common stocks when

there is a better cash flow operating performance. Utilising the Buy-and-Hold Returns and calendar time portfolio approaches, Brick et al. (2004) find no strong evidence to support the asymmetric information and liquidity hypotheses for announcement of a conversion-forcing call. This implies that the negative reaction to this announcement is caused by different factors and is something of a puzzle (Brick et al., 2004, pp.20-21). Korkeamaki and Moore (2004, p.404) indicate that when convertibles are issued with weaker call protection, there will be subsequent capital expenditures of those firms after the issuance. Firms with lower levels of capital investment after the issuance of convertibles also have a longer call protection period (Korkeamaki and Moore, 2004, p.404).

Motivations and Hypotheses

We have been motivated to examine SEO stock price reactions with warrant issuing and, subsequently, their post-issuing performance for three reasons. First, a paucity of research on emerging markets is the main gap identified in our literature review. Second, we employ a different database, leading to a difference in institutional background (Lerskullawat, 2012, p.120[1]). Finally, we expand our study to an area which, according to our literature review, no research has focused on; namely, warrant issuing in the case of Thailand with more recent data from between 1999 and 2006.

The existing studies of Thailand (e.g. Jirasetthakulchai, 2000; Lertsupongkit, 2002; Vithessonthi, 2008; Lerskullawat, 2012) specifically focus on common stock offering and use an older data period than our research[2]. Since there was a substantial rise in the number of SEOs in Thailand between 1999 and 2006, with more than 25 per cent of these firms issuing new shares with warrants, it is interesting to investigate the SEO stock price reactions to warrant issuing and whether the conclusions are similar to works on common stock offerings (which react negatively to SEO announcements). Although Thailand has different institutional backgrounds compared to other markets (e.g. small size, dependent on external and technical factors, and with a high number of individual investors), its differences should not lead to an expectation of any specific results in the area of SEO stock price reaction and offering dilution (Lerskullawat, 2012, p.121). Therefore, our hypotheses will be developed following the previous research as:

$H_{0,1}$: There is a negative impact of security prices on the SEO announcement with warrant issuing.

$H_{0,2}$: There is a negative sign of the percentage of average offering dilution.

The literature review demonstrates that the majority of studies focus on the issuance of convertible bonds, rather than warrants, in the U.S. market. It is clear that no research (based on our review) has considered emerging markets. Consequently, it is interesting to study whether an examination of emerging markets is consistent with those of developed ones. However, in Thailand warrant issuing is a more popular issuing method than convertible bonds if companies prefer to issue new shares in a different way than common stock issuing methods (namely, rights issuing, private placement, stock dividend and public offering). This is because companies issuing bonds in Thailand need to pass a credit rating process, which takes a long time to complete. If the company receives a low rating, the interest rate will be

[1] The institutional backgroud in Thailand in this case is based on the period from 1997 to 2007.
[2] The work by Lerskullawat (2012) is excluded from this case.

high. This leads to the possibility of junk bonds. In contrast, in the process of issuing warrants in Thailand it is unnecessary to pass the credit rating and the process is also similar to common stock issuing[3]. Thus, warrants are frequently chosen by SEO firms instead of issuing via common stocks.

For the above reasons, we will examine stock price reaction and offering dilution with the sample of warrant issuing in Thailand between 1999 and 2006.

DATA AND METHODOLOGY

Data Descriptive

Applying the same data set as Lerskullawat (2012), we have obtained our SEO data mainly from the SET fact books and SET database (SETSMART) relating to the period from 1999 to 2006. The financial statements and financial ratios were obtained from Thomson One Banker. The initial sample from these sources comprises 251 non-financial firms with 1,910 SEOs. We exclude financial companies (including banks and insurance firms) because of the differences in their asset structures. Among these 251 firms, we follow the data organisation in Seiler (2004), who utilised the event window to 15 days before and after the event – the SEO announcement date refers to day 0. For the estimation period, Seiler (2004) employs 100 days before the event window. In order to arrange our initial data to cover a longer period around the event date, we extend the 100 days of the estimation period after the event window. Consequently, our focused event study period is 115 days.

Any firms that contain SP or suspension signs and unavailable data for trading information (i.e. closed prices) are also excluded from our sample. To avoid any overlapping in our sample, we use the first SEO of each company. As a result, we have a final sample consisting of 173 companies. Unlike Lerskullawat (2012), we utilised a sample of 47 warrant offering companies during our study period 1999 to 2006. Although the sample of 47 firms is obviously small in comparison with the existing research on developed markets (such as the 863 firms of D'Mello et al., 2003 and the 438 of Walker and Yost, 2007), it is consistent with the number used for Thailand and other emerging markets. Some examples of this literature are Salamudin et al. (1999), Prangthawat (2002), Lertsupongkit (2002) and Marisetty et al. (2008).

Methodology

In order to compare the empirical consequences between the firms issuing common stocks and those issuing warrants, we make the same considerations stated in previous work (e.g. Asquith and Mullins, 1986; Salamudin et al., 1999; Lertsupongkit, 2002; Vithessonthi, 2008), which are the announcement effect and offering dilution.

1. SEO Stock Price Reaction

Methodologies such as market model, event study frameworks, a normal student t-test, ordinary least square (OLS), cross-sectional analysis and the capital asset pricing model

[3] See Lerskullawat (2012, pp.69-105).

(CAPM) are the key ones employed in much of the literature of more recent years; for example, Teoh et al. (1998b), Gajewski and Ginglinger (2002), Aktas et al. (2007) and Brown et al. (2009). Not only these studies which focus on the developed markets, the research in emerging markets and in Thailand are among the studies applying these key methodologies in their estimations (e.g. Bartholdy et al., 2005; Vithessonti, 2008).

We obtain the calculation of abnormal returns (ARs, hereafter) because the ARs are adjusted with the beta of each security (Lerskullawat, 2012).

$$AR_{it} = R_{it} - E(\tilde{R}_{it}) \qquad (1)$$

where t = day measured relative to the event;

AR_{it} = abnormal return to security i for day t;

R_{it} = return on security i during day t; and

$E(\tilde{R}_{it})$ = expected rate of return on security i for day t

$E(\tilde{R}_{it})$ is estimated by the market model, as suggested by MacKinlay (1997)[4]. As a consequence, equation 1 can be rewritten as:

$$AR_{it} = R_{it} - \alpha_{it} - \beta_{it}(R_{mt}) \qquad (2)$$

where R_{mt} = market return on day t (in our case defined as return on the SET index, which is the main composite index in the SET)

α_i = intercept

β_i = the OLS estimators of the market model parameters, calculated in the estimation period.

Since equation 1 is defined, it leads to the measurement of cumulative abnormal return (CAR, hereafter) displayed as:

$$CAR_{i(t_1,t_2)} = \sum_{t=t_1}^{t_2} AR_{it} \qquad (3)^5$$

where t_1 and t_2 are the days between the event window.

We use an event window of 15 days before and after the event, employing day 0 as an event date. Seiler (2004) suggests that, with extremely certain events with little possibility of leakage of information, as little as a plus and minus event window, e.g. ±10 days, can be used. Since there are many speculators and the characteristics of the market in Thailand are helpful for insider trading, a leakage of information might occur. Consequently, it could be worth covering this leakage. In order to pursue this, we extended the event window up to 15 days, as indicated.

We define the offering dilution on the basis of a suggestion by Asquith and Mullins (1986). This defines the discounting of stock prices after issuing, in terms of market capitalisation:

[4] MacKinlay (1997) demonstrates four possible models for measuring normal performance: (1) Constant mean return model – referred to as the simplest model, (2) Market model, (3) Statistical model and (4) Economic model: e.g. CAPM (Capital Asset Pricing Model) and APT (Arbitrage Pricing Model).

[5] The calculation of CAR is based on MacKinlay (1997, p.21).

$$OfferingDilution(\%) = \left(\frac{MktCap_0 - MktCap_{+1}}{MktCap_{+1}} \right) \times 100 \quad (4)$$

where $MktCap_0$ = Market Capitalisation on day of announcement

$MktCap_{+1}$ = Market Capitalisation on the day after announcement.

We claim that our investigation of warrant issuing firms is an expansion of the existing research on common stock offering firms (i.e. Lerskullawat, 2012). Since no evidence of SEO (with warrants) is found in our literature review, our findings could allow us to carry out an examination of SEO in Thailand for one of the most popular issuing method, which is frequently applied in the market.

EMPIRICAL RESULTS

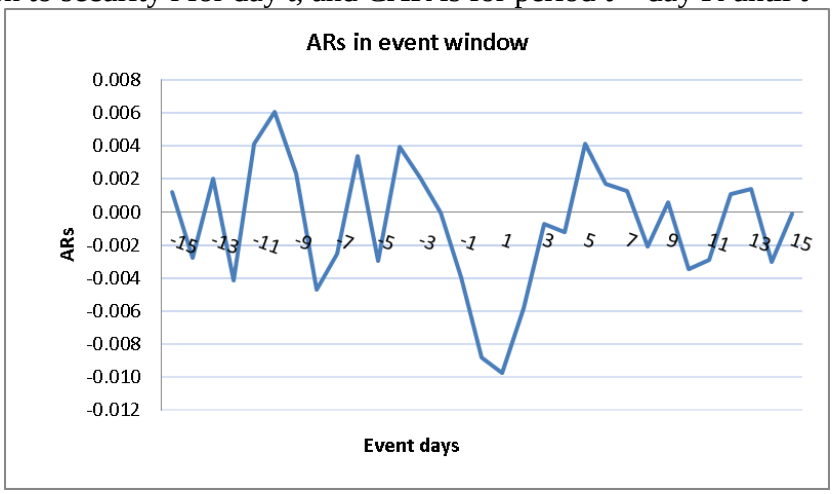
Stock Price Reaction to SEO Announcement

CARs begin to decline substantially in around five days prior to the announcement date (around day -15 to day -10), until the end of our event window. A sharp fall in CARs is clearly seen during the three days before and after the announcement (day 0). However, CARs at the beginning of the event window appear to fluctuate slightly, as demonstrated in Figure 1.

The two-day announcement abnormal returns are statistically significant at a 10% level of confidence, with t-values of -1.74420 on day 0 and -1.68517 on day +1 (see Table 1). These explain why stock prices react negatively to the SEO announcement when the companies use warrants as their issuing method. These outcomes are also consistent with the prior investigation by Lerskullawat (2012) and our hypothesis (Hypothesis 1, see section 2.2) that there is a negative reaction of stock prices to an SEO announcement. Moreover, this evidence shows similar aspects to the existing research on both developed and emerging markets (e.g. Lertsupongkit, 2002; Walker and Yost, 2007). Even though those works on emerging markets (such as Jirasetthakulchai, 2000; Mishra, 2007) are particularly focused on other events, their findings reveal negative reactions to the published information (namely, dividend announcements and stock splits), which is the same as our SEO announcements.

Figure 1: Graphs of abnormal returns and cumulative abnormal returns in event windows

The line graphs show abnormal returns (ARs) and Cumulative Abnormal Returns (CARs) for each relative day during the event window. ARs are calculated by the market model: $AR_{it} = R_{it} - \alpha_{it} - \beta_{it}(R_{mt})$; where R_{it} is the return on security i for day t, and R_{mt} is the return on market. The CARs are calculated by the equation: $CAR_{i,K,L} = \sum_{t=K}^{L} AR_{it}$; where AR_{it} refers to abnormal return to security i for day t, and CAR is for period t = day K until t = day L



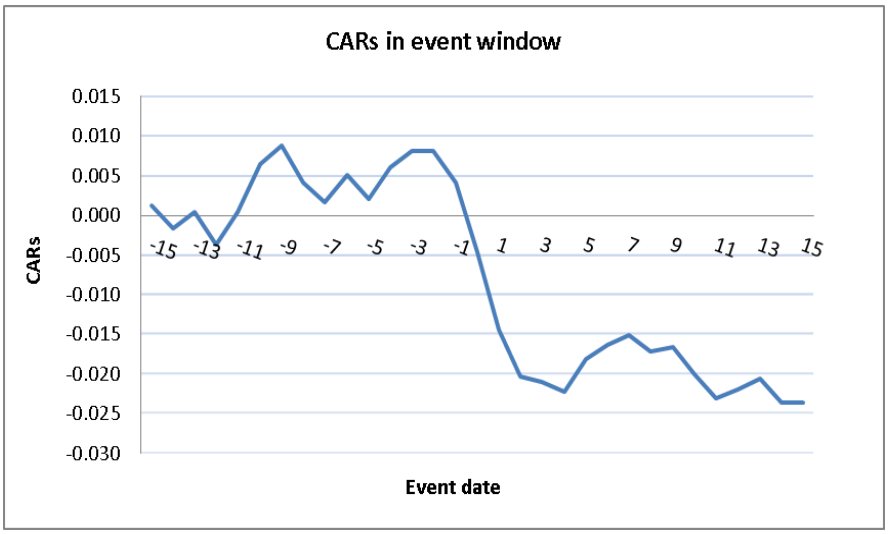


Table 1: Mean abnormal returns surrounding the warrant SEO announcement

The table shows the mean abnormal returns during the event window 15 days before and after the announcement for the total sample of 47 warrant issuing firms. Day 0 refers to the announcement date. The abnormal return (AR) is calculated by the market model: $AR_{it} = R_{it} - \alpha_{it} - \beta_{it}(R_m)$, where R_{it} is return on security i for day t, α_{it} is intercept, β_{it} is the OLS estimators of the market model parameter and R_{mt} is market return on day t (SET index in our case). The t-statistics (t-ratio) are calculated as: $t = \frac{AR_{it}}{S_{AR}/\sqrt{n}}$, where n = sample size, and S_{AR} = standard deviation of AR_{it}.

Event Days	ARs	t-statistics	CARs	Sample Size
-15	0.00119	0.12091	0.00119	47
-14	-0.00280	-0.58325	-0.00162	47
-13	0.00200	0.34078	0.00039	47
-12	-0.00412	-0.41921	-0.00373	47
-11	0.00415	0.65420	0.00042	47
-10	0.00608	0.88327	0.00649	47
-9	0.00232	0.43778	0.00881	47
-8	-0.00470	-0.90418	0.00411	47
-7	-0.00250	-0.65428	0.00161	47
-6	0.00341	0.50216	0.00502	47
-5	-0.00297	-0.60838	0.00205	47
-4	0.00393	0.65621	0.00598	47
-3	0.00209	0.48965	0.00807	47
-2	-0.00001	-0.00247	0.00806	47
-1	-0.00395	-1.10325	0.00411	47
0	-0.00881	-1.74420*	-0.00470	47
1	-0.00976	-1.68517*	-0.01446	47
2	-0.00581	-1.20649	-0.02027	47
3	-0.00072	-0.20690	-0.02099	47
4	-0.00120	-0.17858	-0.02219	47
5	0.00410	0.62234	-0.01809	47
6	0.00171	0.34118	-0.01638	47
7	0.00127	0.17021	-0.01511	47
8	-0.00208	-0.39766	-0.01719	47
9	0.00057	0.12027	-0.01662	47
10	-0.00348	-0.53438	-0.02011	47
11	-0.00291	-0.60891	-0.02302	47
12	0.00110	0.25030	-0.02192	47
13	0.00137	0.36465	-0.02055	47
14	-0.00301	-0.49051	-0.02356	47
15	-0.00010	-0.03122	-0.02367	47

* Significant at 10% level, ** Significant at 5% level, *** Significant at 1% level

Unlike the outcomes of stock price reaction in non-warrant issuing firms (see, for instance, Lerskullawat, 2012), our results in Table 1 show no sign of information leakage prior to the SEO announcement. This is supported by the fact that there are no significant t-values during the pre-event window. Furthermore, our findings are mainly consistent with the previous research on Thailand by Lertsupongkit (2002) and Vithessonthi (2008), in that there is no leakage of information during the event window of SEO announcements. To be more specific, while we report no evidence of leakage information, which is consistent with Vithessonthi (2008), we demonstrate the results of negative stock price reaction to the SEO announcement, which is consistent with the study by Lertsupongkit (2002). Nevertheless, in order to confirm our results of leakage information, Elton et al. (2003) and Seiler (2004) suggest expanding the event window to cover the leakage period in the event study framework. Should we have no evidence of leakage information, we can confirm that the news of warrant issuing are fully published to the public. We thus consider extending our event window by another 15 days to cover the leakage period. Consequently, we have a new event window for our robustness of CARs of 30 days before and after the event date (a 61-day event window).

Robustness of CARs

The outcomes reveal that there are two significant t-statistics on the event dates of -22 and -23 at 10% (see Table 2). These show that evidence of warrant issuing leaks to inside investors prior to the announcement when the event window is extended. Moreover, the t-statistic values are significant on the two-day announcement abnormal returns at 10% (-1.69952 on day 0 and -1.82264 on day 1) – see Table 2. Hence, Hypothesis 1 remains consistent even in the 61-day event window. The CARs graphs fluctuate during the full event window period, showing a sharp rise after the announcement date (see Figure 2). Furthermore, the ARs are not equal to zero in our 61-day event window, allowing investors to obtain them. Therefore, investors are able to use inside information to invest when the SEO firms issue via warrants. This also makes the CARs graphs are slightly different from the CARs graphs of 31-day event window.

In addition, the results in our robustness 61-day event window show a contrast in our previous outcomes regarding leakage information. In other words, we find statistical confirmation that information is leaked prior to the announcement of warrant SEOs when we examine the larger event window (i.e. ±30 days). These cause the t-statistics to be significant around day -22 and day -23 (see Table 2). There could be two reasons to explain how investors can gain abnormal returns before the SEO announcement. The first is the other external factors which impact on stock prices and the second is that the information is leaked prior to the announcement. External factors can include interest rates, exchange rates, unforeseen situations (e.g. political riots and strikes) and the economic figures (i.e. GDP and growth rate announced by the Bank of Thailand), as well as the global situation. Supporting this, the Kasikorn Research Centre (2002)[6] points out that the movements of the major indices (for example, the Dow Jones Index: DJIA) can have an impact on the SET, although there are low correlations between the SET and these major indices, including other markets in the region (except the Japanese and Korean). As a consequence, Lerskullawat (2012)

[6] Kasikorn Research Centre (2002). **SET Index and the Risk of Recession (**in Thai). Vol. 8 Issue 1345, available from the CD-Rom of Kasikorn Research Centre [Access on 25 April 2013].

suggests that a small event window (i.e. ±15 days and ±10 days) is preferable for close consideration and examination of SEO announcements and information leakage in Thailand.

Table 2: Robustness results of 61 day event window

The table shows the mean abnormal returns (mean ARs) during the event window 30 days before and after the announcement (61 day event window) for warrant issuing firms. Day 0 refers to the announcement date. The abnormal return (AR) is calculated by the market model: $AR_{it} = R_{it} - \alpha_{it} - \beta_{it}(R_{mt})$, where R_{it} is return on security i for day t, α_{it} is intercept, β_{it} is the OLS estimators of the market model parameter and R_{mt} is market return on day t (SET index in our case). The t-statistics (t-ratio) are calculated as: $t = \frac{AR_{it}}{S_{AR}/\sqrt{n}}$, where $n =$ sample size, and $S_{AR} =$ standard deviation of AR_{it}. (*) Significant at 10% level, (**) Significant at 5% level, (***) Significant at 1% level

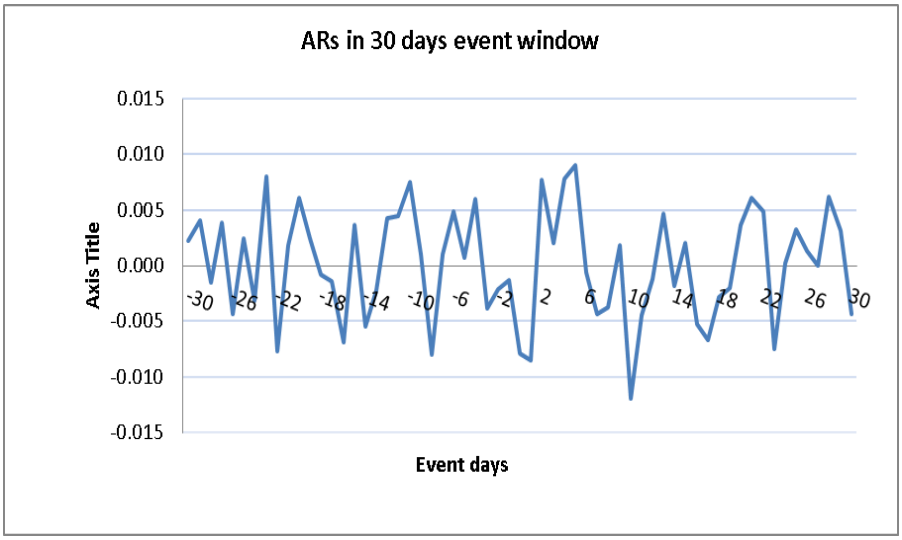
Event Days	ARs	t-statistics	CARs	Sample Size
-30	0.00230	0.46259	0.00230	47
-29	0.00403	0.65368	0.00633	47
-28	-0.00152	-0.44105	0.00481	47
-27	0.00383	0.96095	0.00863	47
-26	-0.00435	-1.28311	0.00428	47
-25	0.00245	0.43628	0.00673	47
-24	-0.00312	-0.97363	0.00361	47
-23	0.00807	1.69907*	0.01168	47
-22	-0.00769	-1.83272*	0.00398	47
-21	0.00186	0.61877	0.00585	47
-20	0.00606	1.41321	0.01191	47
-19	0.00250	0.36122	0.01440	47
-18	-0.00077	-0.13843	0.01363	47
-17	-0.00144	-0.34038	0.01219	47
-16	-0.00685	-0.93396	0.00534	47
-15	0.00371	0.92345	0.00905	47
-14	-0.00545	-1.62581	0.00359	47
-13	-0.00220	-0.53734	0.00139	47
-12	0.00430	0.66623	0.00569	47
-11	0.00451	0.68630	0.01020	47
-10	0.00748	1.04590	0.01768	47
-9	0.00105	0.21538	0.01873	47
-8	-0.00797	-1.47322	0.01076	47
-7	0.00104	0.28750	0.01180	47
-6	0.00484	0.87895	0.01663	47
-5	0.00075	0.16149	0.01738	47
-4	0.00598	1.02011	0.02336	47
-3	-0.00384	-0.98742	0.01952	47
-2	-0.00213	-0.55765	0.01739	47
-1	-0.00129	-0.37017	0.01610	47

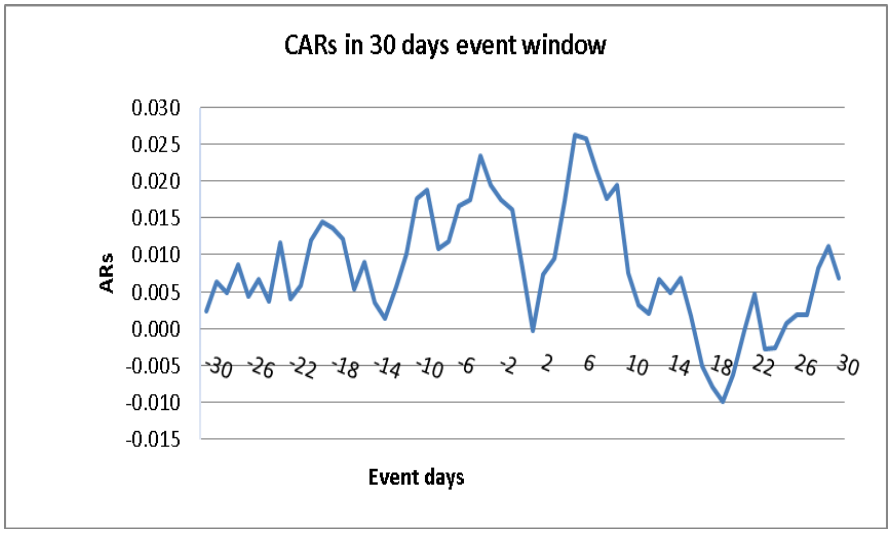
Event Days	ARs	t-statistics	CARs	Sample Size
0	-0.00794	-1.69952*	0.00816	47
1	-0.00852	-1.82264*	-0.00035	47
2	0.00772	1.53912	0.00737	47
3	0.00206	0.59015	0.00943	47
4	0.00781	1.35871	0.01724	47
5	0.00907	1.38127	0.02631	47
6	-0.00055	-0.11379	0.02577	47
7	-0.00430	-0.59130	0.02147	47
8	-0.00378	-0.83627	0.01769	47
9	0.00183	0.47891	0.01953	47
10	-0.01195	-2.14349**	0.00757	47
11	-0.00444	-0.96728	0.00313	47
12	-0.00119	-0.31708	0.00194	47
13	0.00472	1.46179	0.00667	47
14	-0.00179	-0.40161	0.00488	47
15	0.00202	0.61676	0.00690	47
16	-0.00529	-1.29593	0.00161	47
17	-0.00667	-2.10319**	-0.00506	47
18	-0.00284	-0.62621	-0.00790	47
19	-0.00204	-0.53882	-0.00994	47
20	0.00363	0.48184	-0.00631	47
21	0.00608	1.39590	-0.00023	47
22	0.00487	1.01830	0.00464	47
23	-0.00747	-2.17674**	-0.00283	47
24	0.00018	0.04895	-0.00265	47
25	0.00329	0.62896	0.00064	47
26	0.00130	0.39085	0.00194	47
27	-0.00002	-0.00412	0.00192	47
28	0.00617	1.20898	0.00809	47
29	0.00313	0.61654	0.01122	47
30	-0.00438	-1.37261	0.00684	47

* Significant at 10% level, ** Significant at 5% level, *** Significant at 1% level

Figure 2: Graphs of abnormal returns and cumulative abnormal returns in the robustness event window

The line graphs show abnormal returns (ARs) and Cumulative Abnormal Returns (CARs) for each relative day during the event window. The event window is defined as 30 days before and after the event date. ARs are calculated by the market model: $AR_{it} = R_{it} - \alpha_{it} - \beta_{it}(R_{mt})$; where R_{it} is the return on security i for day t, and R_{mt} is the return on market. The CARs are calculated by the equation: $CAR_{i,K,L} = \sum_{t=K}^{L} AR_{it}$; where AR_{it} refers to abnormal return to security i for day t, and CAR is for period t = day K until t = day L.





Offering Dilution

Concerning offering dilution, the value of the firm on announcement day changes by approximately 0.87%, with the minimum percentage of offering dilution by -12.35% (see Table 2). This means that shareholders of warrant issuing firms could lose a maximum of 12.35% in current market values. Furthermore, this 12.35% loss in market value is much less

than the possible maximum loss in the case of common stock offering firms (total sample), which is 22.83% (see Lerskullawat, 2012, p.173). This shows that warrant issuing could help reduce offering dilution during the SEOs. Consequently, our hypothesis of negative average offering dilution (Hypothesis 2, see section 2.2) is rejected. This also implies that the equity value when the issue is announced is less than the post-announcement equity value, indicated by a positive average offering dilution. Therefore, our evidence is certainly inconsistent with Hypothesis 2, in that the average offering dilution is negative. According to the evidence of non-warrant issuing firms (see Lerskullawat, 2012, p.141), the characteristics of the Thai capital market are different from those of developed markets (e.g. Asquith and Mullin, 1986). An example of this can be seen in the method of issuing in Thailand during our study period of 1999 to 2006. While the existing literature concerns SEO samples with public offering, Thai SEO data refer mostly to the issuing of new shares to existing shareholders. Consequently, issuing methods such as rights issuing, private placements and warrants issuing, are widely used, rather than public offering.

Table 3: Offering dilution of warrant issuing firms

The table shows the offering dilution of warrant issuing during the event window. The percentage of the dilution column is defined as the ratio of the change in equity value (market capitalisation) on the day of announcement (day 0) to equity value on day +1.

Dilution (%)	Number of Firms	Average Dilution in the Range	Cumulative (%)
0 <	19	6.23	6.23
(-10) < ≤ 0	27	-1.30	4.93
(-20) < ≤ (-10)	1	-10.19	-5.26
(-30) < ≤ (-20)	0	0.00	-5.26
(-40) < ≤ (-30)	0	0.00	-5.26
(-50) < ≤ (-40)	0	0.00	-5.26
(-60) < ≤ (-50)	0	0.00	-5.26
(-70) < ≤ (-60)	0	0.00	-5.26
(-80) < ≤ (-70)	0	0.00	-5.26
(-90) < ≤ (-80)	0	0.00	-5.26
(-100) < ≤ (-90)	0	0.00	-5.26
TOTAL	**47**		
Average Offering Dilution	0.00866 (0.86600%)		
Median (%)	0.00		
Maximum (%)	25.00		
Minimum (%)	-22.83		

CONCLUSION

Even though our initial expectation was that there would be a substantial difference in the way warrant issuing companies perform following the same procedures as in common stock cases, those results report similarly to our estimations. In the stock price reaction, there is a negative response of warrant issuing SEO firms on the announcement date. This is consistent with our previous study on common stock offering firms in Thailand (see Lerskullawat, 2012). However, our evidence indicates that offering dilution leads to differences in the outcomes between SEO warrant issuing firms and those issuing via common stocks. Thus, issuing new shares via warrants appears to be less risky compared with non-warrant issuing (total sample), and reduces the offering dilution.

For more in-depth analysis, we intend to examine the post-issuing performance of these warrant SEO firms. Several studies (e.g. Spiess and Affleck-Graves, 1995; Barber and Lyon, 1997; Hertzel et al., 2002; Kothari and Warner, 2006) suggest variety of methodology for measuring the post-issued SEOs' performance. The popular methodologies, such as the Buy-and-Hold Return (BHR) approach, will be considered first for application in our investigations.

REFERENCES

1. Aktas, N., De Bodt, E. and Cousin, J.-G. (2007) Event studies with a contaminated estimation period. **Journal of Corporate Finance**, 13 (1): 129-145
2. Asquith, P. and Mullins, D. W. (1986) Equity issues and offering dilution. **Journal of Financial Economics**, 15 (1-2): 61-89
3. Barber, B. M. and Lyon, J. D. (1997a) Detecting long-run abnormal stock returns: The empirical power and specification of test statistics. **Journal of Financial Economics**, 43 (3): 341-372
4. Bartholdy, J., Olson, D. and Peare, P. (2005) **Conducting event studies on a small stock exchange**. Working paper, Social Science Research Network.
5. Billingsley, R. S. and Smith, D. M. (1996) Why do firms issue convertible debt? **Financial Management**, 25: 93 – 99
6. Brick, I. E., Palmon, O. and Patro, D. K. (2004) **Stock price response to calls of convertible bonds: still a puzzle.** Working paper, Social Science Research Network
7. Brooks, C. (2008) **Introductory econometrics for finance**, Cambridge: Cambridge University Press.
8. Brown, P. R., Lee, M., Owen, S. A. and Walter, T.S. (2009) **Corporate governance and the long-run performance of firms issuing seasoned equity: An Australian study**. Working paper, Social Science Research Network.
9. Chemmanur, T. J. and Fulghieri, P. (1997) Why include warrants in new equity issues? A theory of unit IPOs. **Journal of Financial and Quantitative Analysis,** 32 (1): 1-24.
10. D'Mello, R., Tawatnuntachai, O. and Yaman, D. (2003) Does the sequence of seasoned equity offerings matter? **Financial Management**, 32 (4): 59-86
11. Dunbar, C. G. (1995) The use of warrants as underwriter compensation in initial public offerings. **Journal of Financial Economics**, 38: 59-78
12. Eckbo, B. E., Masulis, R. W. and Norli, Ø. (2006) **Security offerings**. Working paper, Social Science Research Network

13. Eckbo, B. E., Masulis, R. W. and Norli, Ø. (2000) Seasoned public offerings: Resolution of the new issues puzzle. **Journal of Financial Economics**, 56 (2): 251-291
14. Ederington, L. H. and Goh, J. C. (2001) Is a convertible bond call really bad news? **The Journal of Business**, 74 (3): 459-476.
15. Elton, E.J., Gruber, M.J., Brown, S.J. and Goetzmann, W. N. (2003) **Modern portfolio theory and investment analysis (6th Ed.),** New York: Wiley
16. Gajewski, J.F. and Ginglinger, E. (2002) Seasoned equity issues in a closely held market: Evidence from France. **European Finance Review**, 6 (3): 291 – 319
17. Hertzel, M., Lemmon, M., Linck, J. S. and Rees, L. (2002) Long-run performance following private placements of equity. **Journal of Finance**, 57 (6): 2595-2617
18. Jirasetthakulchai, M. (2000) **The study of dividend announcements and seasoned equity offerings in the stock exchange of Thailand**. Master's dissertation, Chulalongkorn University
19. Korkeamaki, T. P. and Moore, W. T. (2004) Convertible bond design and capital investment: the role of call provisions. **Journal of Finance**, 59 (1), 391-405
20. Lerskullawat, P. (2012) **Seasoned equity offering in an emerging market: evidence from Thailand**, Lap Lambert Academic Publishing GmbH & Co., Saarbrucken, Germany
21. Lertsupongkit, P. (2002) The **Thai stock market's reaction to equity offering announcements.** Master's dissertation (Finance), Thammasat University
22. Lewis, C. M., Rogalski, R. J. and Seward, J. K. (1998) Agency problems, information asymmetries and convertible debt security design. **Journal of Financial Intermediation**, 7: 32-59
23. Lewis, C. M., Rogalski, R. J. and Seward, J. K. (2001) The long-run performance of firms that issue convertible debt: an empirical analysis of operating characteristics and analyst forecasts. **Journal of Corporate Finance**, 7 (4): 447-474
24. Mackinlay, A. C. (1997) Event studies in economics and finance. **Journal of Economic Literature**, 35 (1): 13-39
25. Mann, S. V., Moore, W. T. and Ramanlal, P. (1999) Timing of convertible debt issues. **Journal of Business Research**, 45 (1): 101-105
26. Marisetty, V. B., Marsden, A. and Veeraraghavan, M. (2008) Price reaction to rights issues in the Indian capital market. **Pacific-Basin Finance Journal**, 16 (3): 316-340
27. Mayers, D. (1998) Why firms issue convertible bonds: The matching of financial and real investment options. **Journal of Financial Economics**, 47 (1)**:** 83-102
28. Mishra, A. K. (2007) The market reaction to stock splits: Evidence from India**. International Journal of Theoretical & Applied Finance**, 10 (2): 251-271
29. Ng, C. K. and Smith, R. L. (1996) Determinants of contract choice: The use of warrants to compensate underwriters of seasoned equity issues. **Journal of Finance**, 51 (1): 363-380
30. Prangthawat, W. (2002) **Earning management and the performance of seasoned equity offerings: Evidence from the stock exchange of Thailand**. Master's dissertation, Chulalongkorn University
31. Salamudin, N., Ariff, M. and Nassir, M.D. (1999) Economic influence on rights issue announcement behavior in Malaysia. **Pacific-Basin Finance Journal,** 7: 405-427
32. Seiler, M. J. (2004) Chapter 13: Event studies in **Performing financial studies – a methodological cookbook**. Upper Saddle River, N.J. Pearson/Prentice Hall
33. Singh, A. K., Cowan, A. R. and Nayar, N. (1991) Underwritten calls of convertible bonds. **Journal of Financial Economics**, 29 (1): 173-196

34. Teoh, S. H., Welch, I. and Wong, T. J. (1998b) Earnings management and the underperformance of seasoned equity offerings. **Journal of Financial Economics**, 50 (1): 63-99
35. Vithessonthi, C. (2008) What explains stock market reactions to proposals to increase the authorized common stock? **Journal of International Finance and Economics**, 8 (1): 126-136
36. Walker, M. D. and Yost, K. (2007) **Seasoned equity offerings: What firms say, do, and how the market reacts?** Working paper, Social Science Research Network