J. of Multi. Fin. Manag. 23 (2013) 272–284

Contents lists available at SciVerse ScienceDirect

Journal of Multinational Financial Management

journal homepage: www.elsevier.com/locate/econbase

Management of the IPO performance in Thailand

Ekkachai Boonchuaymetta[a,*], Wiparat Chuanrommanee[b]

[a] H.K. & Thai Food Co., Ltd., Bangkok, Thailand
[b] Martin de Tours School of Management and Economics, Assumption University, Bangkok, Thailand

ARTICLE INFO

Article history:
Received 7 May 2012
Accepted 30 May 2013
Available online 8 June 2013

JEL classification:
G11
G12
G14
G15
G17
G23

Keywords:
Initial public offering
IPO allocation
Ownership concentration
Underpricing
Underwriter reputation

ABSTRACT

This research aims to explore the relationships between six major IPO elements in Thailand: underwriter reputation, ownership concentration, book-building, IPO allocation, the length of the lock up period, and investor interest and underpricing. The sample comprises 153 IPOs listed between 2001 and 2011. Cross-sectional analysis reveals that IPO allocation appears to be the strongest factor with a negative relation to underpricing. The length of the lock up period, issue size, industry, and hot issue market show significant and positive relationships with underpricing. Underwriter reputation is not associated with underpricing as the choice of underwriter is restricted by the Thai regulator's requirements. Book-building does not explain underpricing. Institutional investors play very limited roles in Thai IPOs. A small change in ownership concentration does not affect underpricing. Nevertheless, a longer lock up period can yield a higher initial return. Such a provision can restrain insider dealing.

1. Introduction

Initial public offering (IPO) is the first sale of stock issued by a private company to raise capital in the equity market (Carter and Manaster, 1990) by which the issuer firm is converted into a public company. This transformation requires a substantial effort, particularly on the part of the company's top management team, to prepare the IPO firm for the scrutiny of the regulator and the investment community (Filatotchev and Bishop, 2002). In a particular IPO activity, the issuer undergoes a number of processes with cautious decisions. The decision made in each process will then affect the initial return of IPO performance. These determinants in a variety of market environments include underwriter reputation, ownership concentration, pricing procedure, IPO allocation, length of lock up, and

* Corresponding author. Tel.: +66 81 905 5488; fax: +66 2 874 2399.
E-mail address: Dr.Ekkachai@yahoo.com (E. Boonchuaymetta).

1042-444X/$ – see front matter © 2013 Elsevier B.V. All rights reserved.
http://dx.doi.org/10.1016/j.mulfin.2013.05.004

investor interest (Carter et al., 1998; Venkatesh and Neupane, 2005; Chahine, 2007; Jenkinson and Jones, 2007; Tirapat, 2004; Reese, 1998).

Numerous researchers have attempted to develop both theoretical and empirical models to explain the initial return of IPO performance (Logue, 1973; Ibbotson, 1975; Baron, 1982; Ritter, 1984, 1991; Rock, 1986; Carter and Manaster, 1990; Aggarwal and Rivoli, 1990; Loughran and Ritter, 1995). Nevertheless, the existing literature on such determinants is mainly based on the U.S. and countries in developed markets, which are subject to different regulatory and market-specific environments. It is unlikely that the determinants found in a developed market can fully work in the Thai capital market which is considered somewhat inefficient, unstructured and highly regulated. The asymmetric information problem is more pronounced and likely to be more rigorous. The Thai stock market is in a developing stage. Major market indicators; the stock market's significance,[1] the number of newly listed companies, the total number of listed companies and market capitalization are far lower than those in both developed and emerging markets (WFE, 2011). Moreover, there is limited empirical evidence on the determinants of IPO activity in Thailand. A few specific factors influencing IPO performance in Thailand have been investigated independently such as IPO allocation (Lonkani, 1999), ownership structure (Connelly et al., 2004), the length of the lock up period (Tirapat, 2004), and book building (Keoplung, 2007). This research aims to explore these major determinants of IPO initial return in Thailand simultaneously. The findings of the model with the integration of major IPO elements related to performance can replicate real business practices and add to the growing literature of empirical studies in emerging markets. Their applications will benefit mainly the issuers, investors and underwriters participating in IPO activity and also the Thai regulator. Higher numbers of IPOs may then be achieved.

2. Literature review and hypothesis development

2.1. The Thai IPO market

Thailand is considered as one of the major emerging countries in the Asian market. However, the stock market's significance[2] is recorded at only 89% in 2010, far less than those of the other countries in the same market, including Hong Kong (1197%), Korea (111%), and Malaysia (187%). Between 2007 and 2010, the number of IPOs was only 6 IPOs per year with capital raised through IPO of only Bt10 billion per year. In comparison, during more aggressive IPO activity between 2002 and 2006, there were over 2 IPOs per month with average capital raised of Bt33 billion per year (SET, 2011). The average initial return of Thai IPOs was only 18% for a total number of 153 IPOs in the decade. Its initial returns showed only 2% in 2008 and 5% in 2009 (SET, 2011). It is much less than those of the other countries in the emerging Asian economy, such as China (202%), Korea (70%) and Malaysia (62%) (Moshirian et al., 2010). The different degrees of such initial return and number of IPOs suggest that there are some market-specific features in Thailand that influence IPO initial return and activity.

2.2. Theoretical explanation and previous empirical evidences on underpricing

Previous studies found a phenomenon associated with positive initial return on the first trading day of initial public offerings, known as "underpricing" (Moshirian et al., 2010; Vong and Trigueiros, 2010; Zouari et al., 2009; Vithessonthi, 2008; Yeh et al., 2008; Chen et al., 2007; Zheng, 2007). Underpricing is defined as the initial return of new share offerings which is measured by the percentage difference between the first-day closing price in the secondary market and the offering price at which the IPO shares were sold in the primary market (Chan, 2010; Chang et al., 2008; Shi-yu and Chang, 2008; Ritter, 1998). It can alternatively be measured as the amount of "money left on the table", which is

[1] Stock market significance is determined by dividing stock market capitalization with gross domestic market (GDP). It is a standardized measure used to explain the link between stock market performance and the strength of its economy and assesses stock market liquidity.

[2] A ratio greater than 100% means the stock market can mobilize funds for the nation's economic growth efficiently and vice versa.

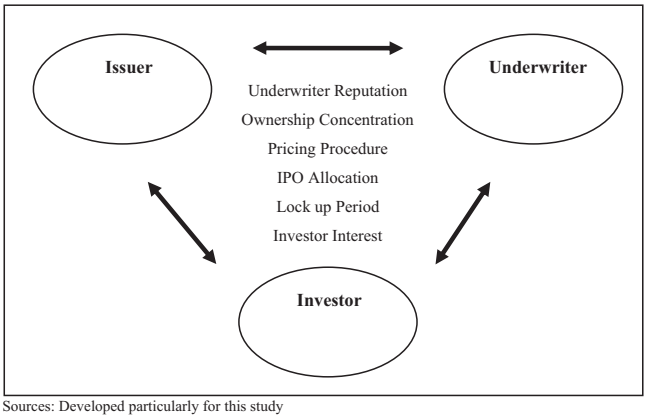

Fig. 1. The triangular relationship between investor, issuer, and underwriter.
Sources: Developed for this study.

calculated by the difference between the first-day closing price and the offering price, multiplied by the number of shares sold at the IPO (Loughran and Ritter, 2002).

The question "why don't issuers get upset about leaving money on the table in IPOs" can be answered by prospect theory, which explains that issuers consider the change in wealth rather than the level of wealth. It means that the amount of the wealth lost from leaving money on the table is less than the amount of unexpected wealth gain from the remaining shares from a stock price increase (Loughran and Ritter, 2002).

Fig. 1 demonstrates the triangular relationship between three major parties in an IPO activity, namely the issuer, the investor, and the underwriter. It explains the linkages among the elements during an IPO process. Initially, the issuer appoints an underwriter to help determine which type of security is to be issued, the best offering (subscription) price and the time to bring it to the market (Chen et al., 2006). The reputation of the underwriter is the first element that influences the IPO performance. A discussion between the underwriter and the issuer on the percentage of ownership holding after companies go public is held. The percentage of ownership holding is used to manage and control the company. Ownership concentration is a second variable. During the pricing process, the lead underwriter gathers investor demand by book building, the third variable. At the same time, the underwriter needs to allocate new issues based on the disclosed investor information. IPO allocation represents the fourth variable determining IPO performance. As regulated by the Securities Exchange Commission (SEC), the lock-up period is established for a specified period of time to prevent sales of new equity issues by inside investors. Lockup agreement influences stock reaction and IPO valuation, representing the fifth variable. After the commencement of the IPO process until the first trading day, the newspaper citation, a proxy of investor interest, can influence the IPO performance. Investor interest is the sixth variable.

When shares are first traded on the stock market, it is in the issuer's interest to price the IPO shares below the highest price at which the underwriter can sell, resulting in larger combined proceeds from the initial and second offerings (Chemmanur, 1993). The issuer cannot only raise capital from the public, but can also increase the value of existing holdings when the initial return occurs (Loughran and Ritter, 2002). An underwriter not only receives commission fees from the issuer, but also gains reputation and potential offers when the issues are successful (Carter, 1992). An IPO that is oversubscribed to a greater degree is more associated with underpricing (Chemmanur, 1993). The issuer and underwriter view an underpriced and oversubscribed IPO as successful (Chemmanur, 1993; Muscarella and Vetsuypens, 1989) while the investor views underpricing as a successful IPO. Underpricing is, therefore, the mutual target of the three parties to participate in the IPO activity. Successful IPOs are thus underpriced (Ritter and Welch, 2002). It is proposed to use the underpricing

of IPOs as a proxy for successful IPOs in this study. The number of companies going public is higher when IPOs are underpriced (Lowry and Schwert, 2002).

Discussion in the literature review related to the determinants of underpricing and the proposed hypothesis are as follows:

2.2.1. Underwriter reputation

Underwriters set an offering price that is sufficiently low to attract the demand of investors, but sufficiently high to raise enough capital for issuers. They have discretion to allocate the shares among investors (Rocholl, 2009). Low-risk firms would reveal their strong information to the market through prestigious underwriters. The uncertainty of stock price on IPO stocks would reduce as the asymmetric information declines; thus the closing price on the first trading day could be closer to the market price resulting in lower underpricing (Beatty and Ritter, 1986; Johnson and Miller, 1988; Carter and Manaster, 1990; Carter et al., 1998; Helou and Park, 2001; Kenourgious et al., 2007). On the basis of asymmetric information theory, the first hypothesis states:

H1. The more prestigious the underwriter, the significantly lower the level of underpricing

2.2.2. Ownership concentration

The ownership concentration negatively influences short run IPO performance (Fama and Jensen, 1983; Venkatesh and Neupane, 2005; Yeh et al., 2008). When the proportion of ownership is large, information asymmetry will increase and monitoring control will decrease and vice versa. This leads to higher agency costs, resulting in the lower performance of the firm. Investors are not willing to pay more for the IPO shares, leading to lower underpricing. Accordingly,

H2. The higher the ownership concentration after an IPO, the significantly lower the level of underpricing

2.2.3. Pricing procedure

Most IPO companies in Thailand conduct book building to gather investor demand, especially from institutional investors. When book building is undertaken, underwriters can obtain information on investor demand for shares. They can set the offer price close to their demand, leading to lower initial return on the first trading day (Benveniste and Spindt, 1989; Benveniste and Wilhelm, 1990; Corrnelli and Goldreich, 2001). The third hypothesis states:

H3. A firm that conducts book building when pricing has a significantly lower level of underpricing

2.2.4. IPO allocation

Institutional investors as informed investors reveal their information during book building. Underwriters use the information from informed investors to determine the offering price and its allocation. In return, the underwriter would distribute larger portions of IPO to institutional investors. The more the private information received, the greater the underpricing the informed investors should earn (Benveniste and Spindt, 1989; Hanley and Wilhelm, 1995; Aggarwal et al., 2002; Jenkinson and Jones, 2007). On this basis, the fourth hypothesis states:

H4. The greater the allocation of IPO to institutional investors, the significantly higher the level of underpricing.

2.2.5. Lock-up period

The lockup provision is an agreement between issuers and underwriters. It can potentially protect investors from a negative stock price reaction (Mohan and Chen, 2001), can be used to signal the quality of offerings and a commitment tool to reduce the moral hazard problem. Brav and Gompers (2003) found a positive relationship between underpricing and lockup length. Nevertheless, The Stock Exchange of Thailand (SET) stipulates at least 6-months silent period for all Thai IPO companies. Based on asymmetric information theory, the fifth hypothesis states:

H5. The greater the length of the lock up provision, the significantly higher the level of underpricing

2.2.6. Investor interest

Based on the investor attention model (Merton, 1987), media coverage can lastingly affect the stock valuation. It draws more investor attention to the stocks when they are familiar with them. Several papers have documented empirical investigations of the positive relationship between investor interest and underpricing (Reese, 1998; Cook et al., 2006; Chahine, 2007; Liu et al., 2009; Da et al., 2009). Whenever a citation is published in a well-known newspaper, it indicates either that there is sufficient general interest in that company, or that the company is doing something remarkable, and its citation probably draws investor interest. In contrast, if a firm is not often cited in any newspaper, it may indicate little interest among investors in that company (Reese, 1998). Thus, the last hypothesis is:

H6. The greater the investor interest, the significantly higher the level of underpricing

3. Research design

3.1. Sample selection

The sample comprises 153 IPOs listed on the SET between 2001 and 2011, representing almost the whole population of IPOs listed on the SET during the period of study. Two companies are excluded since the data are not available. Data are obtained from several sources; the database of the SET, the SEC, Country Group Securities Research Department, FinansiaSyrus Securities Research Department, and NewsCenter. The data for the name, the proportion of shares sold and retained, the name of the underwriter, the pricing procedure, the ownership concentration, the offering price, the subscription date, the age of companies, and the gross proceeds are collected by hand from the prospectuses. The date of first day trading on each IPO is collected from the SET's database. Data for the proportion of shares allocated to investors and the number of shares sold by each underwriter are collected from the IPO Selling Report of the SEC. The closing prices on the first trading day, the SET index, the industry classification, and the length of the silent period are extracted from FinansiaSyrus Securities and Country Group Securities' databases. The number of newspaper citations is collected from the NewsCenter database.

Table 1 (Panel A) shows the distribution of Thai IPOs listed on the SET by year between 2001 and 2011. The number of IPOs varies from year to year, with some years having fewer than 10 IPOs and others having more than 30. The highest number of IPOs was recorded at 36 companies in 2004, while the lowest was reported at only three companies in 2011. The highest aggregate proceeds were reported at Baht 75 billion in 2004, which accounted for 30% of the entire amount of proceeds during the study period, while the lowest is reported at only Baht 4 billion in 2011. The 153 companies in the sample raised a total of Baht 251 billion (about US$8 billion) worth of new equity issues. Panel B presents the industry classifications of IPOs. Seven subsamples based upon the industry classification assigned by the SET are financial, industrial, property, services, technology, resources, and all other industries. The largest number of IPOs is from the property industry, whereas the financial and technology industry represent the second and third highest number of IPOs in the sample, respectively. In terms of aggregate proceeds, the resources industry ranks first at Baht 131 billion (accounting for 52% of the aggregate proceeds), followed by services industry (Baht 38 billion) and property industry (Baht 28 billion).

Table 2 demonstrates initial returns categorized by the six major elements. Most IPO companies underwritten by non-prestigious underwriters can yield an initial return of 18.29%. Slightly more than half of IPOs maintained a highly concentrated ownership after the IPO and generated an initial return of 14.73%, whereas the remaining companies yielded a much better initial return of 19.70%. Almost half of the Thai IPOs conducting book building show an initial return of 15.76%, which is much lower than those in fixed-price IPOs of 20.54%. Most IPO companies allocate their shares to retail investors, which can yield an initial return of 19.16%, whereas fewer companies (16%) distribute their shares to institutional investors, which generates a much lower initial return of 12.65%. For the length of the lock up period, 107 companies have a long length of lock up period of over 540 days, which can

Table 1
The sample of IPOs in Thailand.

Year	Number of IPOs	Aggregate proceeds	
		(Million Baht)	(%)
Panel A: by year			
2011	3	4031	1.60
2010	4	5416	2.15
2009	6	4902	1.95
2008	8	19,947	7.93
2007	6	10,783	4.28
2006	12	36,787	14.62
2005	34	29,351	11.66
2004	36	74,889	29.76
2003	21	22,249	8.84
2002	17	9645	3.83
2001	6	33,641	13.37
Total	153	251,639	100.00
Industry	Number of IPOs	Aggregate proceeds	
		(Million Baht)	(%)
Panel B: by industry			
Financial firms	25	16,848	6.70
Industrial firms	17	12,682	5.04
Property firms	41	28,166	11.19
Service firms	20	38,279	15.21
Technology firms	23	18,349	7.29
Resources firms	16	130,850	52.00
Other firms	11	6466	2.57
Total	153	251,639	100.00

The IPOs are classified by the date of issue. Proceeds are calculated as the total number of offered shares sold multiplied by the offer price.

Table 2
The classification of six major elements on average initial returns.

Major elements (Number of years)	Classification	Average initial returns (%)	Standard deviation (%)	Max. returns (%)	Min. returns (%)	Number of IPOs	
						Number	(%)
Underwriter	Prestigious	17.58	35.38	151.75	−15.79	25	16
Reputation	Non-prestigious	18.29	35.73	166.67	−43.24	128	84
Ownership	High	14.73	30.86	146.67	36.40	81	53
Concentration[a]	Low	19.70	36.26	151.75	−43.24	72	47
Pricing procedure	Book building	15.76	26.75	106.67	−19.87	75	49
	Fixed price	20.22	42.28	166.67	−43.24	78	51
IPO allocation to	Institutional	12.65	28.38	90.91	−16.87	23	15
Investors[b]	Retail	19.16	36.69	166.67	−43.24	130	85
Length of lock up	Long	18.54	36.57	151.75	−43.24	107	70
Period[c]	Short	17.61	33.72	166.67	−36.40	46	30
Investor interest[d]	High	10.14	25.88	146.67	−23.91	46	30
	Low	20.28	36.06	151.75	−43.24	107	70

[a] A high degree of ownership concentration is classified at 67%; otherwise is defined as the low degree (Connelly et al., 2004).
[b] IPO allocation to institutional investors is classified over 50% of share distribution; otherwise is defined as IPO allocation to retail investors.
[c] For length of lock up period, the long length is defined as the length of silent period above 540 days (Tirapat, 2004); otherwise is defined as the short length.
[d] For investor interest, high level is defined above the 70th percentile; otherwise is defined as the low level.

generate an initial return of 18.54%. Last, most IPO companies with a lower degree of investor interest experience initial returns of 20.28%.

3.2. Measurement and model specification

As suggested by Ritter (1991) and Loughran and Ritter (2002), the market adjusted initial return of company ($MAIR_{i,t}$) is used to measure the short run performance in this study. It is defined as an abnormal return, which is the initial return after adjusting for the benchmark return (conventionally the market index return is used). The initial return of IPO ($IR_{i,t}$) is defined as the percentage change between the first-day closing price and the offer price, which is expressed as

$$IR_{i,t} = \frac{P_{i,c}}{P_{i,ipo}} - 1 \tag{1}$$

where $P_{i,c}$ represents the closing price "c" of company "i" at the end of the first closing day and $P_{i,ipo}$ represents the offer price of the company "i".

The market adjusted initial return for IPOs is measured by the difference between the return of company "i" and the market return. The calculation is specified as follows:

$$MAIR_{i,t} = IR_{i,t} - IR^{m}_{i,t} \tag{2}$$

where $IR^{m}_{i,t}$ represents a market return (based on the SET index) at the time of IPO for company "i".

The market adjusted initial return can measure the performance in terms of rate of return as a standardized measure, instead of a baht amount. It is an abnormal initial return which is already adjusted by the market return between the offering day and the first trading day of IPO, while traditional underpricing cannot reveal this excess initial return.

A cross-sectional regression analysis is employed to analyze the factors influencing the IPO performance on the first trading day. All six major factors: underwriter reputation, ownership concentration, the book building procedure, IPO allocation, the length of silent period, and investor interest, and control variables, namely, the issue size, age, industry and hot issue market are included in this model. The effect of offering size on the initial return was examined by Beatty and Ritter (1986), Ritter (1991), and Carpenter and Rondi (2006). An IPO with a small offering size is riskier than an IPO with a large offering size, thus a smaller IPO should provide more underpricing than a large IPO to compensate the investors for the higher risks. The age of an IPO company can be used as a proxy for ex ante uncertainty. Young IPO firms tend to show more underpricing than old IPO firms (Carter and Manaster, 1990; Loughran and Ritter, 2004). The impact of the industry category on the initial return is examined since IPOs in different industries seem to be different in several features. The variation in the initial returns is exhibited across industries (Ritter, 1984). Hot issue market refers to the time period of the initial returns and the number of companies going public. Higher initial returns tend to induce greater IPO volumes (Ritter, 1984; Lowry and Schwert, 2002).

The model is estimated using the Ordinary Least Squares method and the t-statistics is used to test the significance of the coefficients. In addition, a standardized factor is applied to compare the six major factors on the initial returns. The cross-sectional regression model is shown as follows:

$$\begin{aligned} MAIR_i &= \beta_0 + \beta_1 UR_i + \beta_2 OWN_i + \beta_3 BB_i + \beta_4 INS_i + \beta_5 LOCK_i + \beta_6 II_i + \beta_7 SIZE_i \\ &+ \beta_8 AGE_i + \beta_9 IND_i + \beta_{10} HOT_i + \mu_i \end{aligned} \tag{3}$$

where UR represents the lead underwriter's average market share during the three years prior to the IPO. The market share is the market volume of IPO offerings for each underwriter divided by the total volume of new issues in that year, OWN represents the sum of the retention of ownership at a 5% level or more. The shareholders related to the major shareholders as reported in the prospectus are also included, BB is a dummy variable equal to 1 for IPOs using a book building pricing procedure and 0 for IPOs using fixed pricing, INS represents the proportion of shares allocated to institutional investors relative to all share allocations, which is announced in the IPO selling report submitted to the SEC, $LOCK$ represents the length of the silent period in Thailand. It is calculated by the natural logarithm of the length of the silent period, II represents investor interest. It is calculated by the

Table 3
Average initial returns by year of issuance.

Year	Average initial returns (%)	Standard deviation	*t*-Value	Max. returns (%)	Min. returns (%)	Aggregate money left on the table (Million Baht)	Annual market return (%)
2011	8.80	16.76	0.90	27.86	−3.67	583	−0.72
2010	27.60	25.22	2.19	59.26	−1.96	433	40.60
2009	5.64	9.03	1.53	16.16	−9.02	423	63.25
2008	2.18	14.73	0.42	26.56	−23.91	920	−47.56
2007	26.42	59.10	1.09	146.67	−5.96	719	26.22
2006	1.47	12.89	0.39	36.89	−16.88	28	−4.75
2005	10.28	24.31	2.47**	90.91	−23.08	717	6.83
2004	12.11	33.28	2.18**	98.75	−43.24	15,775	−13.48
2003	49.57	43.48	5.22***	151.75	−36.4	12,108	116.60
2002	17.26	31.88	2.23**	106.67	−12.43	1763	17.32
2001	45.83	62.03	1.81	166.67	2.14	1075	12.88
Overall	18.03	35.48	6.29	166.67	−43.24	34,544	19.74

Notes: Market return is calculated based on the SET index return. Money left on the table is calculated as the difference between the first-day closing price and the offer price, multiplied by the number of shares sold at the IPO. Significance level of 10% are denoted with *.

** Significance level of 5%.

*** Significance level of 1%.

natural logarithm of the number of newspaper citations, which is counted between the period of offering date and the first trading day, *SIZE* represents the size of the IPO offering. It is defined in terms of gross proceeds, which are the total number of offered shares sold multiplied by the offer price. It is measured by taking the natural logarithm of average gross proceeds of underwriter's issue, *AGE* represents the age of the company from the year of establishment to the IPO offering. It is calculated by the natural logarithm of one plus the number of years since the IPO company started to operate before going public, *IND* represents the industry classification. It is a dummy variable equal to 1 for IPOs in industries categorized as financial, property, and resources firms and 0 otherwise, *HOT* represents the hot issue market. It is a dummy variable equal to 1 for IPOs in year 2002–2003 and 0 otherwise.

4. Empirical results

4.1. Initial returns by year of issuance

Table 3 presents the results of average initial returns, standard deviation, *t*-value, maximum and minimum initial returns, aggregate money left on the table, and market returns between 2001 and 2011. The highest initial return was 50% in 2003, whereas the lowest initial return was only 1% in 2006. The average initial return for Thai IPOs reported positive returns at 18%, and are significantly different from zero (*t*-value = 6.29), indicating that investors who buy IPOs at the offer price and sell the shares at the end of the first trading day can earn a return of 18% on average. The average initial return for Thai IPOs is much less than those of other emerging Asian market countries such as China (202%), Korea (70%), and Malaysia (62%) (Moshirian et al., 2010).

The distribution of initial returns in Thai IPOs indicates that there have been five years, namely 2001, 2002, and 2003, 2007, and 2010 experiencing high IPO underpricing. The initial returns in these years were 46%, 17%, 50%, 26%, and 28% respectively. Only the initial returns in 2002 and 2003 are significantly underpriced; therefore, these two years are considered hot issue markets[3].

With the exception of 2007 and 2010, there is some tendency for firms making IPOs after year 2003 to have low initial returns. The overall average initial return of IPOs (18%) is under the annual market return of 20%, indicating that investors who invest in new equity issues can earn less than investing in the overall market by 2% on average. The highest amount of aggregate money left on the table was

[3] 2004 and 2005 are not specified as hot issue years since initial returns are much less than the overall average initial returns.

Table 4
Average initial returns by industry.

Industry	Average initial returns (%)	Standard deviation (%)	t-value	Max. returns (%)	Min. returns (%)
Financial firm	30.14	43.86	3.44***	166.67	−12.43
Industrial firm	11.02	29.95	1.52	90.91	−23.91
Property firm	11.54	29.67	2.49***	98.75	−23.20
Service firm	8.68	20.56	1.89	76.92	−19.29
Technology firms	20.42	40.75	2.40**	117.11	−43.24
Resources firms	27.59	34.30	3.22***	106.67	−6.25
Other firms	23.69	48.48	1.62	146.67	−7.10
Overall	18.03	35.48	6.29***	166.67	−43.24

Significance level of 10% are denoted with *.
** Significance level of 5%.
*** Significance level of 1%.

Baht 16 billion in 2004, which far exceeds the lowest amount of only Baht 28 million in 2006. The total amount of money left on the table is Baht 35 billion (about US$ 1 billion).

4.2. Initial returns by industry

Table 4 presents the average initial returns categorized by industry. The average initial returns are positive and statistically significant for all industry categories, except industrial, service, and all other industries. The average initial returns vary across industries, ranging from the service industry at 9% (t-value = 1.89) to the financial industry at 30% (t-value = 3.44). Only three IPOs from the financial, technology, and resources industry experience significantly high underpricing[4]. Thus, these three industries are explored later on to determine the effect of industry in a cross-section regression.

4.3. Cross sectional regression results

There are two cross-sectional regression models of statistical operation whereas the market adjusted initial return is the dependent variable. Based on the estimation of Eq. (3), the first model examines whether there is any significant relationship between the six major elements and initial returns. The second model compares the individual impact of the six major elements on initial returns.

Table 5 presents bivariate correlation analysis among variables. It reports a modest correlation between book building (*BB*) and IPO allocation to institutional investors (*INS*), and between investor interest (*II*) and the hot issue market (*HOT*), with correlations of 0.54 and -0.57, respectively. None of the independent variables has a high correlation. The variance-inflating factor (VIF) on each pair of variables, calculated by the value of the correlation, is also low. This suggests that these six independent variables and control variables are not highly correlated, and there is not much effect of increasing partial correlation on the variance and covariance of an estimator. Therefore, the problem of multicollinearity is not likely to be a major issue in the regression model.

The results of cross-sectional regression for the first model are summarized in Table 6 (Column 2). Approximately 25% of the variation in the market adjusted initial return is collectively explained by six major elements (18.63% adjusted)[5]. In Model 1, the regression result indicates that only IPO allocation to institutional investors and the length of the lock up period are the key determinants of underpricing in Thailand. The length of the lock up period shows a significant and positive relationship with underpricing ($\beta_5 = 0.0974$, $t = 2.2212$). When the length of the lock up period increases

[4] IPOs in the property industry are not specified as high underpricing since initial returns are much less than the overall average initial returns.

[5] This low value is also consistent with the findings of many previous studies (Carter et al., 1998). This seems relatively low; however, in cross-sectional data, the low coefficient of determination is typically obtained, possibly due to the diversity of the units in the sample data (Gujarati, 2003).

Table 5
Correlation matrix for variables in the determinants of market adjusted initial returns.

	MAIR	UR	OWN	BB	INS	LOCK	II	SIZE	AGE	FIN	TECH	RES
UR	−0.04											
OWN	−0.10	0.03										
BB	−0.08	0.28	0.04									
INS	−0.17	0.41	−0.04	0.54								
LOCK	0.02	0.07	0.01	−0.03	−0.01							
II	−0.16	0.21	0.21	0.08	0.19	0.07						
SIZE	0.20	0.40	0.15	0.30	0.39	−0.16	0.16					
AGE	−0.02	−0.05	−0.01	0.21	0.06	0.02	0.16	0.11				
FIN	0.15	−0.05	−0.06	−0.15	−0.16	−0.12	−0.10	0.06	−0.19			
TECH	0.01	0.01	−0.12	−0.12	−0.07	−0.16	−0.02	−−0.13	−0.03	−0.19		
RES	0.10	0.25	−0.02	0.22	0.26	0.01	0.21	0.32	0.09	−0.15	−0.14	
HOT	0.33	−0.02	−0.24	0.04	−0.12	−0.32	−0.57	0.08	−0.09	0.15	0.10	−0.08

Notes: *MAIR*: market adjusted initial returns, *UR*: underwriter reputation measured by the market share of lead underwriter, *OWN*: ownership concentration, *BB*: book building, *INS*: IPO allocation to institutional investors, *LOCK*: length of silent period, *II*: investor interest, *SIZE*: the issue size, *AGE*: age of firm, *FIN*: financial industry, *TECH*: technology industry, *RES*: resources industry, *HOT*: the hot issue market.

Table 6
Cross-sectional regression analysis.

Coefficient	Model 1	Model 2
Intercept	−0.7265	
	(−1.8899)*	
Underwriter reputation	−0.5478	−0.0384
	(−1.4541)	(−1.2490)
Ownership concentration	−0.2622	−0.0218
	(−1.0136)	(−0.7822)
Book building	−0.0117	−0.0154
	(−0.1840)	(−0.4772)
IPO allocation to institutional investors	−0.4396	−0.0716
	(−2.5847)***	(−2.0828)**
Length of lock up period	0.0974	0.0701
	(2.2212)**	(2.4565)**
Investor interest	0.0023	0.0083
	(0.0572)	(0.2465)
Issue size	0.0891	0.3318
	(4.0659)***	(3.3541)***
Age of firm	−0.0093	−0.0029
	(−0.2086)	(-0.1051)
Financial firms	0.1016	0.0328
	(1.3350)	(1.1582)
Technology firms	0.0689	0.2223
	(0.8897)	(0.8004)
Resources firms	0.1589	0.0477
	(1.7037)*	(1.6654)*
Hot issue market	0.2441	0.1159
	(3.3072)***	(3.2940)***
R^2	0.2506	0.2501
Adjusted *R*2	0.1863	0.1859
F-statistic	3.9008	3.8918
Prob. (*F*-statistic)	0.0000	0.0000
Observations	153	153

Notes: Model 2 is identical to Model 1, but standardized regression coefficients are used.
The *t*-statistics are reported under the coefficients in parentheses.
* Significance level of 10%.
** Significance level of 5%.
*** Significance level of 1%.

Table 7
Results of the hypothesis testing.

Hypotheses	Results	Sig
H1: The more prestigious the underwriter, the significantly lower the level of underpricing	Rejected	
H2: The higher the ownership concentration after the IPO, the significantly lower the level of underpricing	Rejected	
H3: A firm that conducts the book building method during the pricing process has a significantly lower level of underpricing	Rejected	
H4: The greater the allocation of IPO to institutional investors, the significantly higher the level of underpricing	Rejected	.01
H5: The greater the length of the lock up period, the significantly higher the level of underpricing	Supported	.03
H6: The greater the investor interest, the significantly higher the level of underpricing	Rejected	

(decreases) by 1%, the market adjusted initial return would increase (decrease) on average by 0.0974%, whereas other factors are assumed constant. This strongly supports Hypotheses 5 (Table 7). For IPO allocation to institutional investors, this study rejects Hypotheses 4 because a significant and negative relationship between underpricing and IPO allocation to institutional investors was found ($\beta_4 = -0.4396$, $t = -2.5847$). A 10% increase in the IPO allocation to institutional investor results in a lower initial return adjusted by the market of 4.40%. Of these two elements, IPO allocation appears to be the strongest factor explaining the level of underpricing (Model 2).

The remaining major elements: underwriter reputation, ownership concentration, book building, and investor interest are not statistically significant. Hypotheses 1, 2, 3, and 6 are thus not supported in this study (Table 7).

For the control variables, the issue size is significantly positive at a 1% level ($\beta_7 = 0.0891$, $t = 4.0659$). An increase in the gross proceeds of an IPO would increase the level of underpricing. For the impact of industry, only IPOs in resources firms are significantly positive at a 10% level, suggesting that IPOs in resources firms can yield a higher market adjusted initial return of 15.89% than IPOs in other industries. For the hot issue market dummy, the coefficient of 0.2441 is significantly positive at a 1% level. IPOs issued in year 2002–2003 yielded a higher market adjusted initial return of 24.41% than those IPOs issued in other years.

5. Conclusion

Only IPO allocation and the length of the lock up period are the key determinants of underpricing in Thailand. The length of the lock up period shows a significant and positive relationship with underpricing whereas IPO allocation to institutional investors has a significant and negative relationship with underpricing. Among these two elements, IPO allocation appears to be the strongest factor explaining the level of underpricing. For the control variables, except for the age of the firm, the issue size, the industry, and the hot issue market, significantly influence the initial returns.

Underwriter reputation does not have an impact on underpricing, which is inconsistent with the signaling theory and the findings of most existing literature. As the choice of underwriter is restricted by the Thai Securities Exchange Commission's requirements, it might be less important for the IPO firms to find and appoint a reputable one (Pratoomsuwan, 2012). Book-building does not explain the underpricing level since less than half of the Thai IPO firms conduct it. Institutional investors also play very limited roles in Thai IPO activity. Ownership of Thai IPO companies is still highly concentrated after the IPO (ranging from 35% to 89%). Most of them are controlled by family groups. As a result, a small change in ownership concentration after the IPO does not affect underpricing. Nevertheless, a longer lock up period can yield a higher initial return since such a provision can restrain insider dealing, which impedes free competition in the Thai market.

When making a Thai IPO investment decision, investors are recommended to consider IPO companies that allocate the majority of IPOs shares to the retail investors. They should beware of investing in newly issued shares that have a low length of lock up period. They should focus on IPOs with large

issue size and are categorized in the resources industry. This would yield higher initial returns. Underwriters should use their discretion to allocate shares to retail investors. Regular investors can assist underwriters as insurance by standing ready to support prices and absorb future issues (Binay et al., 2007). This can benefit underwriters in improving their reputation, building a good relationship among underwriters and investors, and increasing the possibility of participation in future offerings. Issuer firms should select underwriters that have strong retail networks. To help create an environment conducive to higher numbers of IPOs, Thai regulators should encourage IPO companies to offer a larger issue size, which will be sufficiently large to induce more participation from institutional investors. Book building is worth conducting in order to gather demand from informed investors. The offering price and allocation of shares will ultimately better reflect the demand and supply in the market.

With these recommendations, more successful Thai IPOs will be achieved leading to greater numbers of IPOs and better economic development of the nation. IPO activities can indicate that investors are optimistic and confident about economic prospects (Lowry, 2003; Lowry and Schwert, 2002; Zhou and Zhou, 2010).

References

Aggarwal, R., Prabhala, N.R., Puri, M., 2002. Institutional allocation in initial public offerings: Empirical evidence. J. Finan. 57, 1421–1442.

Aggarwal, R., Rivoli, P., 1990. Fads in the initial public offering market? Finan. Manage. 20, 45–57.

Baron, D.P., 1982. A model of the demand for investment banking advising and distribution services for new issues. J. Finan. 37, 955–976.

Beatty, R.P., Ritter, J.R., 1986. Investment banking, reputation, and the underpricing of initial public offerings. J. Finan. Econ. 15, 213–232.

Benveniste, L.M., Spindt, P.A., 1989. How investment bankers determine the offer price and allocation of new issues. Journal of Financial Economics 24, 343–361.

Benveniste, L.M., Wilhelm Jr., W.J., 1990. A comparative analysis of IPO proceeds under alternative regulatory environments. J. Finan. Econ. 28, 173–207.

Binay, M.M., Gatchev, V.A., Pirinsky, C.A., 2007. The role of underwriter–investor relationships in the IPO process. J. Finan. Quant. Anal. 42, 785–810.

Brav, A., Gompers, P.A., 2003. The role of lockups in initial public offerings. Rev. Finan. Stud. 16, 1–29.

Carpenter, R., Rondi, L., 2006. Going public to grow? Evidence from A panel of Italian firms. Small Bus. Econ. 27, 387–407.

Carter, R.B., 1992. Underwriter reputation and repetitive public offerings. J. Finan. Res. 15, 341–354.

Carter, R.B., Dark, F.H., Singh, A.K., 1998. Underwriter Reputation, initial returns, and the long-run performance of IPO stocks. J. Finan. 53, 285–311.

Carter, R.B., Manaster, S., 1990. Initial public offerings and underwriter reputation. J. Finan. 45, 1045–1067.

Chahine, S., 2007. Investor interest, trading volume, and the choice of IPO mechanism in France. Int. Rev. Finan. Anal. 16, 116–135.

Chan, Y., 2010. Retail Trading and IPO Return in the Aftermarket. Financial Management (Winter), 1475–1495.

Chang, E., Chen, C., Chi, J., Young, M., 2008. IPO underpricing in China: new evidence from the primary and secondary markets. Emerg. Mark. Rev. 9, 1–16.

Chemmanur, T., 1993. The pricing of IPOs: A Dynamic Model with Information Production. J. Finan. 48, 285–304.

Chen, H., Fok, R.C.W., Wang, Y., 2006. Why do underwriters charge low underwriting fees for initial public offerings in Taiwan? J. Bus. Finan. Account. 33, 979–1005.

Chen, Z.H., Choi, J.J., Jiang, C., 2007. Private Benefits in IPOs: Evidence from State-owned Firms. Working paper.

Connelly, J.T., Limpaphayom, P., Siraprapasiri, V., 2004. Ownership concentration and initial public offering performance: empirical evidence from Thailand. Chulalongkorn J. Econ. 16, 252–307.

Cook, D., Kieschnick, R., Ness, R.V., 2006. On the marketing of IPOs. J. Finan. Econ. 82, 35–61.

Cornelli, F., Goldreich, D., 2001. Bookbuilding and strategic allocation. J. Finan. 56, 2337–2369.

Da, Z., Engelberg, J., Gao, P., 2009. In Search of Attention. Working Paper. University of Notre Dame and University of North Carolina at Chapel Hill.

Fama, E., Jensen, M., 1983. Seperation of ownership and control. J. Law Econ. 26, 301–325.

Filatotchev, I., Bishop, K., 2002. Board composition, share ownership and "Underpricing" of U.K. IPO firms. Strategic Manage. J. 23, 941–955.

Gujarati, D.N., 2003. Basic Econometrics, 4th ed. McGraw Hill.

Hanley, K.W., Wilhelm, W.J., 1995. Evidence on the strategic allocation of initial public offerings. J. Finan. Econ. 37, 239–257.

Helou, A., Park, G., 2001. Is There a Signaling Effect of Underwriter Reputation? The Journal of Financial Research 24, 27–43.

Ibbotson, R.G., 1975. Price performance of common stock new issues. J. Finan. Econ. 2, 235–272.

Jenkinson, T., Jones, H., 2007. IPO pricing and allocation: a survey of the views of institutional investors. Rev. Finan. Stud. 22, 1477–1504.

Johnson, J.M., Miller, R.E., 1988. Investment banker prestige and the underpricing of initial public offerings. Finan. Manage. 17, 19–29.

Kenourgious, D.F., Papathanasiou, S., Melas, E.R., 2007. Initial performance of Greek IPOs, underwriter's reputation and oversubscription. J. Managerial Finan. 33, 332–343.

Keoplung, S., 2007. Bookbuilding vs The Effective Pricing Procedures in Thailand Fixed Price. Master Degree, Faculty of Commerce and Accountancy, Thammasat University.

Liu, L., Sherman, A.E., Zhang, Y., 2009. The Role of Media in Initial Public Offerings. Working Paper. DePaul University and Hong Kong University of Science and Technology.
Logue, D., 1973. Premia on unseasoned equity issues. J. Econ. Bus. 25, 133–141.
Lonkani, R., 1999. Information Acquisition and Dissemination of the Initial Public Offerings: the Case of the Thai Stock Market. Chulalongkorn University (Doctoral Dissertation).
Loughran, T., Ritter, J.R., 1995. The new issues puzzle. J. Finan. 50, 23–51.
Loughran, T., Ritter, J.R., 2002. Why don't issuers get upset about leaving money on the table in IPOs? Rev. Finan. Stud. Special 15, 413–443.
Loughran, T., Ritter, J.R., 2004. Why has IPO underpricing changed over time? Finan. Manage. 33, 5–37.
Lowry, M., 2003. Why does IPO volume fluctuate so much? J. Finan. Econ. 67, 3–40.
Lowry, M., Schwert, G.W., 2002. IPO market cycles: bubbles or sequential learning? J. Finan. 57, 1171–1198.
Merton, R.C., 1987. A simple model of capital market equilibrium with incomplete information. J. Finan. 42, 483–510.
Mohan, N.J., Chen, C.R., 2001. Information content of lock-up provisions in initial public offerings. Int. Rev. Econ. Finan. 41, 41–59.
Moshirian, F., Ng, D., Wu, E., 2010. Model specification and IPO performance: new insights from Asia. Res. Int. Bus. Finan. 24, 62–74.
Muscarella, C.J., Vetsuypens, M.R., 1989. A simple test of Baron's model of IPO underpricing. J. Finan. Econ. 24, 125–135.
Pratoomsuwan, T., 2012. The effect of an audit firm's brand on security pricing. Int. J. Emerg. Mark. 7, 430–442.
Reese, W.A., 1998. IPO Underpricing, Trading Volume, and Investor Interest. Working Paper. Tulane University.
Ritter, J.R., 1984. The hot issue market of 1980. J. Bus. 57, 215–240.
Ritter, J.R., 1991. The long-run performance of initial public offerings. J. Finan. 46, 3–27.
Ritter, J.R., 1998. Initial public offerings. Contemp. Finan. Digest 2, 5–30.
Ritter, J., Welch, I., 2002. A review of IPO activity, pricing, and allocations. J. Finan. 57, 1795–1828.
Rocholl, J., 2009. A friend in need is a friend indeed: allocation and demand in IPO bookbuilding. J. Finan. Intermed. 18, 284–310.
Rock, K., 1986. Why new issues are underpriced. J. Finan. Econ. 15, 187–212.
Shi-yu, X., Chang, L., 2008. The degree of IPO underpricing in China. J. Mod. Account. Audit. 4, 32–36.
Stock Exchange of Thailand, 2011. New Listed Companies. Retrieved September 1, 2011 from http://www.set.or.th/set/ipo.do?language=en&country=US
Tirapat, S., 2004. An investigation of the silent period expiration in Thailand. Chulalongkorn J. Econ. 16, 217–251.
Venkatesh, S., Neupane, S., 2005. Does Ownership Structure Effect IPO Underpricing: Evidence from Thai IPOs. School of Management, Asian Institute of Technology, Bangkok, Thailand.
Vithessonthi, C., 2008. The short-run performance of initial public offerings: an experience study for thailand. Bus. Rev. Camb. 9, 48–54.
Vong, A., Trigueiros, D., 2010. The short-run price performance of initial public offerings in Hong Kong: new evidence. Glob. Finan. J. 21, 253–261.
World Federation of Exchanges Member and IMF International Financial Statistics Yearbook 2010–2004, Retrieved January 2011 from: http://www.world-exchanges.org
Yeh, Y., Shu, P., Guo, R., 2008. Ownership structure and IPO valuation-evidence from Taiwan. Finan. Manage. 37, 141–161.
Zheng, S.X., 2007. Are IPOs really overpriced? J. Empirical Finan. 14, 287–309.
Zhou, Z., Zhou, J., 2010. Chinese IPO activity, pricing, and market cycles. Rev. Quant. Finan. Account. 34, 483–503.
Zouari, S.B., Boudriga, A., Taktak, N.B., 2009. What Determines IPO Underpricing? Evidence from a Frontier Market. Working Paper. University of Tunis.