The long-run performance of initial public offerings in Thailand

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This paper analyses the long-run performance of initial public offerings (IPOs) on the Thai Stock Exchange. It uses a sample of 150 IPOs listed on the Thai Stock Exchange Main Board between 1985 and 1992. The initial return is 63.49%. The cumulative adjusted return at the end of the three-year anniversary is 10.02%. This result contrasts with those of most of the studies of long-run IPO performance in developed markets. This result, however, appears sensitive to outlying observations. Whilst there is no significant evidence that the IPOs underperform the market in the long run, removal of outliers from cross-sectional analysis suggest that Thai IPOs may underperform the market in the long run. Further research, including more recent data may help clarify this issue.

I. INTRODUCTION

This paper analyses the long-run performance of initial public offerings (IPOs) on the Thai Stock Exchange. Early studies of IPOs focused on initial as well as immediate aftermarket returns.¹ They found that IPOs exhibit large initial returns. An evaluation of the intrinsic value of IPO stocks is difficult since these stocks are issued by companies with no prior market capitalization. Moreover, these firms may have much of their value represented by growth opportunities rather than assets in place (Hanley and Ritter, 1992). A number of their existing shareholders may also possess non-public information. The existence of high uncertainty about the true value of new issues and the asymmetric information problem has been accepted as factors forcing issuing firms or their underwriters to deliberately underprice their new issues. Several hypotheses developed from these grounds are able to explain why IPOs are intentionally underpriced.² They are, however, unable to precisely identify the correlation of the potential explanations and the magnitude of each rationale for each IPO. Hanley and Ritter (1992) suggest that the explanations for initial underpricing of IPOs are not mutually exclusive. A given reason is also likely to be more important for some IPOs than for others.

Researchers have been further puzzled by the long-run performance of IPOs. Several studies have shown that IPOs underperform the market in the long run. The long-run performance of Thai IPOs and possible explanations are the central concerns in this study.

Ritter (1991) stated that the understanding of IPO performance is beneficial to both investors and issuers. On one hand, investors may develop trading strategies yielding superior returns. On the other hand, the existence of a hot issue market may allow issuers to successfully time their new issues resulting in a lower cost of going public. Some features of Thai economy and stock market are very likely to be different from such countries as US which is the centre

¹ See Reilly and Hatfield (1969), McDonald and Fisher (1972), Reilly (1973, 1977) for examples. For a review of early empirical studies on initial as well as immediate aftermarket performance of IPOs, see Dawson (1987).

 $^{^{2}}$ The proposed hypotheses include the information asymmetry hypothesis (Baron, 1982; Rock, 1986, Beatty and Ritter, 1986), the signalling hypothesis (Leland and Pyle, 1977), the certification hypothesis (Booth and Smith, 1986; Titman and Trueman, 1986) and the lawsuit avoidance hypothesis (Tinic, 1988).

for most empirical studies. Finally, there is only one published work on the performance of Thai IPOs.

The paper is organized as follows. Section II reviews previous studies on the long-run performance of IPOs. The Thai stock markets and IPOs are outlined in Section III. Data, methodology and hypotheses are described in Section IV. Section V reports and discusses the results. A brief conclusion follows in the final section.

II. PREVIOUS WORK

Early studies of the long-run performance of IPOs were undertaken in the United States and several document the existence of long-run underperformance. Stern and Bornstein (1985) show that 1922 new issues floated during 1975–85 underperform the market by 22%. In contrast, Ibbotson (1975) finds that the aftermarket performance of the US common stocks floated during the 1960s is positive in the first year and negative in the next three years before returning to be positive in the fifth year. The aftermarket performance of IPOs has gained more attention recently. The evidence shows strong short-run underpricing. Although the results on long-run performance are mixed, a preponderance of underperformance is evident. See Loughran *et al.* (1994).

Ritter (1991) investigated the 1526 US IPOs floated during 1975-84, and found significant underperformance. IPOs in his sample underperform a group of matching firms over a three year period by 29.13%. The long run underperformance of US IPOs is also documented by Aggarwal and Rivoli (1990). They report the NASDAQ index adjusted return of -13.73% at the 250 post listing day for a sample of 1598 IPOs during 1977-1987. Levis (1993), adopted methods similar to Ritter's (1991), and found that 712 UK IPOs floated during 1980-88 underperform the HGSC Index (Extended Hoare Govett Smaller Companies Index) over a three year period by 8.31%. Long-run underperformance is also found in three Latin America stock markets. Aggarwal et al. (1993) report -47% and -23.7% threeyear returns for 62 Brazilian IPO offerings in 1980-90 and 36 Chilean IPOs in 1982–90 as well as a -19.6% one-year return for 44 Mexican IPOs in 1987-90.

A study of Finnish IPOs by Keloharju (1993) reports a -26.4% long-run cumulated market adjusted return for 79 issues going public between 1 January 1984 and 31 July 1989. In Australia, Mustow (1992), and Allen and Patrick (1994) also document significant long-run underperformance and 36-month post-listing returns of -112.8% and -25.38% are reported. The substantial difference between the results of the two studies may be due to the different time period analysed. Aggarwal and Rivoli (1990) and Ritter (1991) propose that the turn-around of IPO performance inherent in poor long-term performance appears to be consistent with the fads hypothesis of De Bondt and Thaler (1985, 1987).

Aggarwal and Rivoli (1990) suggest that fads are likely to be a good explanation for IPO performance because (i) fads are likely to occur when estimation of the true intrinsic value of the firm is difficult; (ii) risky securities are likely to be subject to high levels of noise trading; (iii) IPO investors appear to be more speculative; and (iv) the marginal investors in initial trading may be overoptimistic.

Ibbotson and Jaffe (1975), and Ritter (1984) provide evidence of the existence of 'hot issue markets'. The hot issue markets are usually defined as periods in which large numbers of IPOs are floated and the average initial returns are abnormally high. It has been argued that during these hot issue periods many poor quality IPOs are floated on the market, taking advantage of market over-optimism – Shiller (1990) and Ritter (1991).

Using gross proceeds as a proxy for *ex-ante* uncertainty, Beatty and Ritter (1986) find that the degree of underpricing is positively related to the *ex-ante* uncertainty about the *ex-post* value of IPOs. De Bondt and Thaler (1985, 1987) report systematic reversals of the past and subsequent abnormal returns for individual securities. They interpret this finding as evidence consistent with the overreaction hypothesis. Therefore, it is expected that a smaller issue should have a higher initial underpricing followed by a worse aftermarket performance.

Ritter (1991) shows that there is some tendency for IPOs which have the highest average matching firm-adjusted initial returns to have the worst aftermarket performance. This tendency is also stronger for smaller issues. Ritter (1991) analyses the long-run performance of IPOs in each year and finds that long-run underperformance is not as general a phenomenon as short-run underpricing. Moreover, he finds that the annual volume of IPOs is negatively related to the aftermarket performance. Loughran et al. (1994) also reach the same conclusion that firms have market timing ability. Ritter (1991) categorized his sample into 13 industries and reported that the long-run performance of IPOs in different industries varies widely. He interpreted the underperformance of IPOs in many industries relative to other firms in the same industries as being consistent with the fads hypothesis.

III. THE THAI STOCK EXCHANGE AND IPOs

Market performance

Established by the government in 1974, the Security Exchange of Thailand (SET), is the only organized stock exchange in Thailand. With trading operations beginning on 30 April 1975, the SET has developed from a minimarket of 21 listed at the end of its first year, into one of the world's emerging markets (Agtmael, 1993). By the end of 1996, the



Fig. 1. SET index and daily average turnover for the period of 1975 to June 1994 (Source: The Stock Exchange of Thailand, 1994, p. 14)



Fig. 2. Market capitalization for common stock and for each sector (as at 30 June 1994) (Source: The Stock Exchange of Thailand (1994, p. 23)

SET had 454 companies and 71 unit trusts listed with a market capitalization of US\$100 billion. Figure 1 depicts the performance of the SET over the past two decades. Apart from a brief boom in 1977/78 where the SET index³ reached a high of 257.73 points, the SET had remained reasonably stable in its first decade of trading. At the end of 1985 the SET index was at 134.73 points.

A number of factors contributed to a dynamic expansion in capital activities from 1986 onwards. Improved confidence in both the Thai domestic and regional political and economic environment, as well as various measures introduced by the SET to facilitate the expansion of trading in the primary and secondary markets (Lian, 1993), encouraged greater investment from domestic and foreign investors.

The Persian gulf crisis, combined with a unfavourable domestic climate resulted in a drop in the SET index of 45%, from a peak of 1143.78 points in July 1990 to 612.86 points at year's end. In the following three years rapid growth in the number of institutional investors, lower interest rates and a inflow of foreign funds, contributed to the growth of the SET index to a new high of 1682.85 points in 1993.

Market structure

Common stocks are the major securities traded in the SET. Although the numbers and market shares of unit trusts are still very small, they have increased significantly during the past few years. The increases have helped to make the market to be more fundamentally based and to reduce manipulations to some extent (Anon., 1994). At the end of June 1994, there were 361 common stocks accounting for 95.91% of total market capitalization. Five of 31 sectors possess the majority of shares (76%) of the common stock market capitalization. Figure 2 portrays the market capitalization of securities in proportion to the market as a whole as well as the market share of each major sector of common stocks.

³ The SET index = (Current market value + Base market value) \times 100 where the market value of 30 April 1975 is used as a base.

IPOs in Thailand

A company wishing to make a public offering must first conform to the requirements of the Securities & Exchange Act (SEA) and gain permission from the Securities & Exchange Commission (SEC). Public offerings follow the procedure briefly outlined below:⁴

- The initial public offering (IPO) or prospectus is submitted to the SEC through an authorized finance and securities company;
- ii. The listing application is then submitted to the SET;
- iii. The application is then considered by the listing subcommittee;
- iv. A company visit and a company management interview is conducted;
- v. SET Board of Governor's grant their approval for listing;
- vi. Trading is then allowed in listed stocks.

The average time for the approval process from the setting of the offer price to the issue date, is generally two to three months (Wethyavivorn and Koo-smith, 1991). However, this can take as long as a year. Investors wishing to subscribe in the IPO are required to pay in advance and the issuer earns interest on all money deposited, even if over subscribed (Chowdhry and Sherman, 1996).

The SET actively encourages small investors through the listing requirements of the SEA. Accordingly companies applying for listing must provide an allocation of shares available to small investors of between 15-30% of the companies' registered capital. A small investor is defined as an entity holding not more than 1% of the listed stock. Furthermore, there must at least be 600 small investors for listed stocks and, at least 300 for listed companies in provincial zones.

The only prior study on the performance of Thai IPOs is by Wethyavivorn and Koo-Smith (1991). They report an initial return of 68.69% for 32 Thai IPOs floated during January 1988 and June 1989. This high initial return is adjusted instantly by the second trading day; the excess return on the second trading day is -0.24%. The adjusted returns for the end of the first, third and sixth month are -8.29, 6.74 and -3.02% respectively. However, none of these returns are significant.

IV. DATA AND RESEARCH METHODS

The initial sample is comprised of 151 IPOs listed on the main board of the Stock Exchange of Thailand between 1985 and 1992. All initial public offerings having the required data; offering date and price, available were included.

Table 1. Distribution of IPOs by year during 1985-92

Year	Total number of IPOs	Numbers of IPOs in the sample	% included
1985	3	1	33.33
1986	1	0	0
1987	19	4	21.05
1988	34	12	35.29
1989	34	16	47.06
1990	39	30	76.92
1991	60	54	90.00
1992	35	34	97.14
Total	225	151	67.11

Table 1 presents the distribution of the sample by year. Since the database is only available to 31 December 1992, the sample size of the after market return analysis will decline and drop to only 32 IPOs in the 36th month. As the sample size of 32 is rather small a two-year aftermarket performance is investigated rather than three-year as generally performed in previous studies.

All the data used in this study except for the offering price, number of shares issued and offering date is obtained from the Pacific-Basin Capital Markets (PACAP) database compiled by The University of Rhode Island. The offering price and date are obtained from the new listed security report compiled by the Investor Services and Information Section, Public Relations Department, The Security exchange of Thailand.

Methodology

The methodology adopted follows Ritter (1991). We first analyse both initial returns and aftermarket returns. Several cross-sectional and time-series analyses are employed in an attempt to explore factors determining IPO performance. Finally, regression analyses are undertaken.

Returns analyses. Returns are calculated for two intervals; the initial return period defined as the offering date to the close of the first trading date, and the aftermarket return period defined as the three years after the IPO exclusive of the initial return period. The aftermarket period is divided into 36 months where month is the calendar month starting from the month following the first trading day. This definition creates a time interval; the second trading day to the last trading day of that month, for IPOs not starting trading at the end of month. This time interval is defined as month 0 and is included in the analyses. For example, the month 0 of an IPO which starts trading on 22 January

⁴ For a more detailed listing of qualifications and procedures for companies refer to Appendices I and II.

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will be the period from the 23rd to the last trading day of January and the monthly period starts from February.

(1) *Initial returns*. The initial return is defined as the percentage change of the stock price from the subscription price and the closing price on the first trading day. It can be written as:

$$r_i = \frac{P_i}{S_i} - 1$$

where P_i = closing price on the first trading day of IPO i and S_i = subscription price of IPO_i .

(2) Aftermarket returns. Following Ritter (1991), the performance of IPOs is calculated by cumulative adjusted returns (CARs) with monthly portfolio rebalancing. Two market returns; the PACAP monthly equally-weighted market returns with cash dividend reinvested⁵ and the PACAP monthly value-weighted market returns with cash dividend reinvested,⁶ are used as the benchmarks.

The CARs can be calculated from the following calculation series:

1. Raw return

(i) for month 0 is calculated as

$$r_{it} = \frac{P_{i,L}}{P_i} - 1$$

where r_{it} is return for IPO_i in month 0; $P_{i,L}$ is closing price of IPO_i on the last trading day of the first trading month; P_i is closing price of IPO_i on the first trading day. (ii) for month 1 to 36 the monthly returns are obtained from the PACAP data base.

2. Market return

(i) for month 0 is calculated as

$$r_{mt} = \prod_{t=S}^{L} \left(1 + dr_{mt}\right) - 1$$

where dr_{mt} is daily market return for IPO_i on day t; S is the second trading day; L is the last trading day of the first trading month.

(ii) for month 1 to 36 the monthly market return is obtained from the PACAP data base

3. Market adjusted returns

$$ar_{it} = r_{it} - r_{mt}$$

4. Average market adjusted return for month *t* on a portfolio of *n* stocks

$$AR_t = \frac{1}{n} \sum_{i=1}^n ar_{it}$$

5. Cumulative market-adjusted return (*CARs*) from month 0 to month t

$$CARs_t = \sum_{t=0}^n AR_t.$$

The calculation of the aftermarket return does not fully take the effect of different risk levels into account. (It is assumed that IPOs have the same systematic risk as the market benchmark employed in the test, but it does not alter the direction of the results.) Balvers *et al.* (1988), Ibbotson (1975) and Reilly (1977) have documented that the systematic risk of new issues is greater than one which is the systematic risk of the market index. The assumption that IPOs have the same systematic risk as the market index, therefore, provides an upward bias in the estimation of the returns and strengthens the results (Ritter, 1991, and Aggarwal and Rivoli, 1990). The average market adjusted return (AR_t) and the cumulative abnormal return (CARs) for each month are tested for their significance.

The *t*-statistics for the AR_t series are calculated as

$$t(AR_t) = AR_t \cdot \frac{(n_t)^{1/2}}{sd_t}$$

where n_t is the number of firms trading in event month t and sd_t is cross-sectional standard deviation for event month t. The statistical significant of the *CARs* is calculated as

$$t(CAR_t) = \frac{CAR_t \cdot (n_t)^{1/2}}{(t \cdot \text{var} + 2(t-1) \cdot \text{cov})^{1/2}}$$

where var is average cross-sectional variance over 36 months and cov is first-order autocovariance of the AR_t series.

As an alternative to the use of *CARs* which implicitly assume monthly portfolio rebalancing, two-year market

⁵ PACAP DATA DEFINITION – Monthly Equally Weighted Market Returns with Cash Dividends Reinvested. (1) Item represents monthly returns with cash dividends reinvested for an equally weighted market portfolio. (2) All stocks with non-missing returns and non-missing market values for the previous month are included in the calculation. (3) The weights are defined as 1/CNTCO, where *CNTCO* is number of stocks included in calculation.

⁶ PACAP DATA DEFINITION – Monthly Value-Weighted Market Returns with Cash Dividends Reinvested. (1) Item represents monthly returns with cash dividends reinvested for an value-weighted market portfolio. (2) All stocks with non-missing returns and non-missing market values for the previous month are included in the calculation. (3) The weight assigned to stock i is

$$\frac{MKTVAL_i}{\sum_{i=1}^{CNTCO} MKTVAL_i}$$

where $MKTVAL_i$ is previous month's total market value of stock *i*, and CNTCO is number of common stocks included in the calculation.

adjusted returns can be calculated as follows:

1. Two-year raw returns

$$2YRR_i = \prod_{t=0}^{24} (1 + r_{it}) - 1$$

where $2YRR_i$ is two-year raw return and r_{it} is monthly return for IPO_i for month t.

2. Two-year market returns

$$2YRMR_{m} = \prod_{t=0}^{24} (1 + r_{mt}) - 1$$

where R_m is two-year market return and r_{mt} is monthly market return for month t.

3. Two-year market adjusted returns

$$2YRAR_i = 2YRR_i - 2YRMR_m$$

These return series will be used in the time-series and crosssectional analyses.

Hypotheses

Six hypotheses are derived from the existing evidence about long-run IPO performance. The first hypothesis is concerned with the long-run performance of IPOs.

Hypothesis 1. H_0 : *IPOs do not significantly under perform the market in the long run.*

The investigation of the possible explanations of the longrun performance of IPOs and the investigation of a fads explanation will be presented in hypotheses 2 to 6. The fads explanation suggests the following relationships. The longrun performance of IPOs is negatively related to the initial underpricing, and the annual volume of listing but is positively related to the age of the issuing firm and the size of issue. It also suggests that the long-run return of IPOs across industries is negative and varies widely. The null hypotheses to test the fads explanation are defined as follows.

Hypothesis 2. H_0 : The long-run performance of IPOs is not a negative function of initial underpricing.

Hypothesis 3. H_0 : The long-run performance of IPOs is not a positive function of issuing size.

Hypothesis 4. H_0 : The long-run performance of IPOs is not a negative function of annual volume of listing.

Hypothesis 5. H_0 : The long-run performance of IPOs is not a function of industries.

Hypothesis 6. H_0 : The long-run performance of IPOs is not a positive function of age of the issuing firm.

Time-series and cross-sectional analyses

A number of time-series and cross-sectional analyses were conducted. These enabled hypotheses 2 to 6, to be investigated.

The initial return, two-year return and two-year adjusted return of the IPOs in the sample are classified into quintiles based upon each factor; the initial return, the issuing size, year, industry and by age. Then, the average return for each quintile is investigated to see whether there are systematic patterns across the returns and the factors employed as a classification basis.

Regression analyses

Various regression analyses were undertaken to assess the explanatory power of each variable investigated in the previous section. Since, the variables are dependent and are not mutually exclusive, both univariate and multivariate regression analyses were undertaken.

(1) Univariate regression. The two-year return as well as the two-year market adjusted return is the dependent variable while initial return, deflated gross-proceeds, volume of listings, and age are used as the explanatory variables in the univariate regression. The regression equations are set out below:

$2YRR_i = \alpha + \beta Initial_i + \varepsilon_i;$	$2YRAR_i = \alpha + \beta Initial_i + \varepsilon_i$
$2YRR_i = \alpha + \beta Size_i + \varepsilon_i;$	$2YRAR_i = \alpha + \beta Size_i + \varepsilon_i$
$2YRR_i = \alpha + \beta Vol_i + \varepsilon_i;$	$2YRAR_i = \alpha + \beta Vol_i + \varepsilon_i$
$2YRR_i = \alpha + \beta Age_i + \varepsilon_i;$	$YRAR_i = \alpha + \beta Age_i + \varepsilon_i$

where $2YRR_i$ is two-year raw return for IPO_i ; $2YRAR_i$ is two-year market adjusted return for IPO_i ; *Initial* is initial underpricing; *Volume* is Log(1 + number of IPO in each year); *Size* is Ln(Deflated Gross Proceeds) for IPO_i ; *Age* is Log(1 + *age*) for IPO_i .

(2) Multivariate regression. As each variable is not independent, multiple regressions will be undertaken to clarify the effect of each factor. Market and industry dummy variables are added into the regressions in order to examine market and industry effects. The multiple regressions can be outlined as:

$$\begin{split} 2YRR_i &= \alpha + \beta_1 Initial_i + \beta_2 Size_i + \beta_3 Vol_i + \beta_4 Market \\ &+ \beta_5 Age_i + \beta_6 Industry + \varepsilon_i \end{split}$$

 $2YRAR_i = \alpha + \beta_1 Initial_i + \beta_2 Size_i + \beta_3 Vol_i + \beta_4 Market$

$$+ \beta_5 Age_i + \beta_6 Industry + \varepsilon_i$$

where $Market_i$ is two-year market return over the same period for IPO_i ; and *Industry* is dummy variable on industry in which IPO_i is operated.

V. RESULTS

Initial return

The average initial return for the sample of 151 IPOs listed on the Stock Exchange of Thailand during 1985–92 is 63.49%. The figure drops slightly to 61.98% when adjusted by the market return using the SET index as the benchmark. This figure is similar to the average initial adjusted return of 68.69% of 32 Thai IPOs reported by Wethyavivorn and Koo-smith (1991). The average initial adjusted return of Thai IPOs is very high when compared with that of US, UK and Australia. For example, Ritter (1991) and Levis (1993) report the average initial adjusted return of about 14% for the US and UK IPOs respectively while Finn and Higham (1988) report an abnormal return of 29.2% for Australian IPOs.

Aftermarket performance

Table 2 reports the average market adjusted returns (AR_t) and cumulative average market adjusted returns (CAR_t) for

Table 2. Abnormal returns for IPOs listed during 1985-92ª

h.			Equally weighted			Value weighted			
Month	Sample	AR_t (%)	<i>t</i> -stat	CAR_t (%)) <i>t</i> -stat	AR_t (%)	t-stat	CAR_t (%)	t-stat
0	143	- 2.90	-2.38	- 2.90	-2.18	- 2.35	-1.90	- 2.35	-1.76
1	147	-1.41	-0.79	-4.31	-2.31	-0.79	-0.44	-3.13	-1.68
2	147	0.19	0.17	-4.12	-1.80	0.92	0.82	-2.21	-0.97
3	147	1.72	1.57	-2.40	-0.91	1.71	1.57	-0.50	-0.19
4	145	-0.82	-0.75	-3.22	-1.08	0.44	0.38	-0.06	-0.02
5	141	0.51	0.35	-2.71	-0.82	0.83	0.58	0.77	0.23
6	139	-2.21	-2.02	-4.92	-1.37	-1.38	-1.21	-0.61	-0.17
7	139	-0.7	-0.63	-5.62	-1.46	-0.63	-0.59	-1.24	-0.32
8	139	0.09	0.06	- 5.53	-1.36	0.20	0.14	-1.04	-0.25
9	139	-1.48	-1.57	-7.01	-1.63	-1.17	-1.17	-2.21	-0.51
10	127	1.43	1.18	- 5.58	-1.18	1.76	1.46	-0.45	-0.09
11	121	1.44	1.06	-4.14	-0.82	2.04	1.45	1.59	0.32
12	117	-1.26	-0.82	- 5.40	-1.01	-0.19	-0.12	1.40	0.26
13	113	-0.66	-0.50	-6.06	-1.08	-0.28	-0.21	1.12	0.20
14	109	1.15	0.83	-4.91	-0.83	1.43	1.11	2.56	0.43
15	106	0.01	0.01	- 4.90	-0.79	0.36	0.30	2.91	0.47
16	97	-0.1	-0.06	- 5.00	-0.75	0.53	0.32	3.45	0.51
17	94	0.73	0.46	-4.27	-0.61	1.24	0.75	4.68	0.67
18	85	-1.65	-1.04	- 5.92	-0.78	-2.10	-1.34	2.58	0.34
19	82	-2.45	-1.55	-8.37	-1.06	-2.47	-1.54	0.12	0.01
20	73	-0.95	-0.49	-9.32	-1.09	-0.39	-0.18	-0.27	-0.03
21	70	-1.57	-1.14	-10.89	-1.21	-0.75	-0.54	-1.02	-0.11
22	64	1.03	0.62	- 9.86	-1.03	2.27	1.32	1.25	0.13
23	63	-0.95	-0.49	-10.81	-1.09	-0.14	-0.07	1.11	0.11
24	62	0.31	0.15	-10.50	-1.03	1.04	0.49	2.15	0.21
25	59	2.5	1.36	-8.00	-0.75	2.61	1.44	4.77	0.45
26	52	1.2	0.56	- 6.80	-0.59	-0.84	-0.40	3.93	0.34
27	53	3.58	1.97	-3.22	-0.28	3.95	2.14	7.88	0.67
28	50	0.41	0.21	-2.81	-0.23	1.03	0.49	8.90	0.73
29	47	0.69	0.24	-2.12	-0.17	0.85	0.28	9.75	0.76
30	41	4.64	1.13	2.52	0.18	5.53	1.38	15.29	1.09
31	40	4.69	0.92	7.21	0.50	5.32	1.10	20.60	1.43
32	40	2.69	1.13	9.90	0.68	3.51	1.46	24.11	1.65
33	38	2.82	0.93	12.72	0.84	4.02	1.29	28.13	1.85
34	37	-1.44	-0.73	11.28	0.72	-0.69	-0.37	27.44	1.76
35	37	-0.02	-0.01	11.26	0.71	1.15	0.75	28.60	1.80
36	32	-1.24	-0.63	10.02	0.58	-1.06	-0.49	27.54	1.59

Note: ^a The average market adjusted returns (AR_t) and cumulative average market adjusted returns (CAR_t) with associated t-statistic for 36 months after going public, excluding the initial return. Two market returns; equally weighted and value weighted are used as the benchmarks. AR_t is computed as $AR_t = 1/n \sum_{i=0}^{n} ar_{it}$, where ar_{it} is the average market adjusted return for IPO *i* in event month *t*. The *t*-statistic is calculated as $AR_t = 1/n \sum_{i=0}^{n} ar_{it}$, where ar_{it} is the average market adjusted return for IPO *i* nevent month *t*. The *t*-statistic is calculated as $AR_t = 1/n \sum_{i=0}^{n} ar_{it}$, where ar_{it} is the average market adjusted return for IPO in event month *t*. The *t*-statistic is calculated as $AR_t \cdot (n_t)^{1/2}/sd_t$, where n_t is the number of firms trading in month *t*, and sd_t is the cross-sectional standard deviation in month *t*. CAR_t is computed as $CARs_t = \sum_{i=0}^{n} AR_t$. The *t*-statistic is calculated as $t(CAR_t) = CAR_t \cdot (n_t)^{1/2}/(t \cdot \text{Var} + 2(t-1) \cdot \text{Cov})^{1/2}$, where Var is the average cross-sectional variance over 36 months and Cov is the first-order autocovariance of the AR_t series. These have a value of 0.000143 and 0.0254 for equally weighted market adjusted returns and a value of 0.000132 and 0.0255 for value weighted market adjusted returns.

the 36 months post listing for IPOs listed during 1985-92. As mentioned previously, the drop in the number of companies in the sample is due to the PACAP database being available only to 31 December 1992. Two market returns are used as a benchmark but we focus first on the equally weighted market adjusted return. The average market adjusted return at the end of the listing month is -2.9% and is statistically significant at the 5% level. This suggests that the high initial underpricing of the IPOs is adjusted quickly in the early aftermarket. After a slight increase over the next three months, the average market adjusted returns fluctuate marginally before turning to a positive adjusted return series during month 24 to 33. These positive return series drive the cumulative average adjusted returns to become positive in the 30th and subsequent months. The cumulative average adjusted return is 10.02% at the end of three year anniversary. Apart from the first two months none of the cumulative adjusted returns are significant at the 5% level.

The aftermarket performance similar to the above patterns is also found when using the value weighted market return as a benchmark. However, the cumulative average adjusted returns for the first two months are significant only at the 10% level. Additionally, the average value weighted market adjusted returns are higher than the average equally weighted returns for every month. The cumulative adjusted return is 27.54% at the end of the 36th month. The different performance of these two aftermarket adjusted returns confirms Ritter's finding that the long run performance of IPOs is sensitive to the benchmark employed. The better performance of the value weighted adjusted return is not surprising since it is consistent with the size effect anomaly documented by Banz (1981). That is small firm investments tend to yield higher returns than large firm ones. Similar results are also reported by Levis (1993). Furthermore, the survivorship bias seems not to be a problem in this study

given that none of the IPOs in the sample is delisted before their three year anniversary. Both the equally weighted and the value weighted market adjusted returns as well as raw returns are depicted in Fig. 3.

The aftermarket performance is consistent with the results reported by Wethyavivorn and Koo-smith (1991). That is the performance of the IPOs is mostly adjusted in the early aftermarket and there is no consistent performance subsequently in the aftermarket. The aftermarket performance, however, does not correspond with other studies. For example Ritter (1991); Mustow (1992); Levis (1993); Aggarwal *et al.* (1993) and Allen and Patrick (1994) find a gradual decline of the long-run adjusted returns over the three year period.

The above results suggest that the hypothesis that IPOs do not significantly under-perform the market in the long-run cannot be rejected.

Cross-sectional and time-series results

Aftermarket performance categorized by initial returns. In Table 3, the 62 IPOs with data available are categorized by initial return. This permits an examination of a relationship between the initial underpricing and the aftermarket performance.

A close inspection of Table 3 suggests that there is no precise systematic relationship between the initial return and the aftermarket returns. The relations are, however, clearer when three IPOs having substantial returns are excluded from the analysis. Table 4 shows the results after excluding the outliers.

After excluding the outliers, there is a strong tendency for the two-year raw returns to be negatively related with the initial returns. IPOs in the higher initial return quintile have the worse aftermarket performance. The relationship is,



Fig. 3. The aftermarket performance of IPOs listing during 1986–1992. (The figure plots the initial raw return together with the cumulative average market adjusted returns (CARs) from month 0 to 36 for three series; raw return (--), equally weighted adjusted returns (---), and the value weighted adjusted returns (---).

Fable 3. Aftermarket	performance categorized	by initial return ^a
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Range of initial return (%)	Two-year return (%)	Two-year equally weighted adjusted return (%)	Two-year value weighted adjusted return (%)
-26 < IR < 0	42.97	- 37.96	- 17.81
0 < IR < 33	52.79	- 44.85	-12.09
33 < IR < 70	148.13	41.34	85.34
70 < IR < 120	11.64	00.00	5.93
120 < IR < 391	- 22.58	- 17.74	-24.13
All (mean)	42.80	-11.09	6.23
All (median)	- 14.25	-20.75	- 22.19

Note: ^a The two-year return is calculated $2YRR_i = \prod_{t=0}^{24} (1 + r_{it}) - 1$ where r_{it} is the monthly return on *IPO_i*, with the PACAP database is the source of the monthly returns. Two-year market returns are calculated over the same period. The two-year adjusted return is calculated from $2YRAR_i = 2YRR_i - 2YRMR_m$.

Table 4. Aftermarket performance categorized by initial return excluding the outliers^a

Range of initial return (%)	Two-year return (%)	Two-year equally weighted adjusted return (%)	Two-year value weighted adjusted return (%)
-26 < IR < 0	42.97	- 37.96	- 17.81
0 < IR < 33	52.79	- 44.85	-12.09
33 < IR < 70	32.99	- 45.94	- 13.93
70 < IR < 120	-15.75	- 31.03	- 24.93
120 < IR < 391	-22.58	- 17.74	-24.13
All (mean)	42.80	-11.09	6.23
All (median)	-14.25	- 20.75	-22.19
Mean (excluding outliers)	14.67	- 34.16	-18.93
Median (excluding outliers)	- 15.18	- 25.48	- 25.24

Note: ^a Three outliers are Finance One Public Co. Ltd. and Ayudhya Life Assurance Co. Ltd from the 3rd quintile and One Holdings Ltd from the 4th quintile.

however, less clear for the two-year adjusted returns. The return patterns for both two-year adjusted returns diverge between high and low initial return quintiles. The two-year equally weighted adjusted returns for the lower initial return quintiles; the first three quintiles, appear to be negatively related with the initial return while the rest of the quintiles have positive relation. In contrast, the two-year value weighted adjusted returns for the lower initial return quintiles; the first two quintiles, are positively related with the initial return whereas the last three quintiles have negative relation. To summarize, it may be generally said that the two-year adjusted returns are negatively related to the initial return. The negative relationship is consistent with the overreaction hypothesis which is also reported by Aggarwal and Rivoli (1990); Ritter (1991) and Levis (1993). Hence, the hypothesis that the long-run performance of IPOs is not a negative function of initial underpricing is rejected.

Aftermarket performance categorized by size. As previously discussed the size of IPOs can be used as a proxy for *ex-ante*

uncertainty about the *ex-post* value of IPOs. The existing evidence on IPO performance also suggests that a smaller issue is more likely to have a higher initial underpricing followed by a worse aftermarket performance. To examine this, the aftermarket returns are grouped by the gross proceeds of the offer. Table 5 reveals a tendency for the smaller issues to perform better than the larger issues in the long run. This finding is in contrast to the market overreaction hypothesis supported by Levis (1993) and Ritter (1991) where he shows that there is some tendency for IPOs which have the highest average matching firm-adjusted initial returns to have the worst aftermarket performance.

Aftermarket performance categorized by year. In Table 6, IPOs are classified by their year of issuance. The results show that the performance of IPOs varies from year to year. Note that there is only one IPO in the 1985 sample. Moreover, this IPO has exceptionally high aftermarket returns but it appears not to be representative and is excluded from subsequent discussions.

Table 5. Aftermarket performance categorized by size^a

Deflated gross proceeds	Two-year return	Two-year equally weighted adjusted return	Two-year value weighted adjusted return
26 < GS < 46	243.67	133.81	174.61
46 < GS < 70	129.40	22.66	59.31
70 < GS < 110	68.82	13.75	30.25
110 < GS < 190	-11.31	- 14.20	-18.40
190 < GS > 850	-14.90	- 24.96	-23.94
850 < GS > 4,500	- 37.71	- 67.69	-68.14
All (mean)	42.80	- 11.09	6.71
All (median)	- 14.25	- 20.75	-22.19

Note: ^aSize is the gross proceeds from the IPOs measured in the Baht of 1990 purchasing power using GDP deflators.

Table 6. Aftermarket performance categorised by year

Year	Numbers of IPOs	Initial return	Two-year return	Two-year equally weighted adjusted return	Two-year value weighted adjusted return
1985	1	19.23	249.12	46.92	113.85
1987	4	31.63	175.51	-124.92	- 8.51
1988	13	35.75	133.69	-12.77	47.16
1989	20	157.83	-13.82	- 15.84	-20.30
1990	24	72.77	10.03	10.32	5.39
All (mean)		88.93	42.80	-11.09	6.71
All (median)		57.14	-14.25	- 20.75	- 22.19

All of the average initial returns are positive suggesting that the initial underpricing is a general phenomenon. The substantial increase of the average initial return in 1989 is largely attributed to the market boom. The considerable drop in the 1990 average initial return is mainly due to a slump in the market caused by the Persian Gulf Crisis. Almost half of IPOs listed during the Gulf War period have a negative initial return. Excluding these IPOs, the average initial return increases to 103.44%. In contrast, there are no systematic patterns in the aftermarket performance.

The two-year returns are very high for IPOs listed in 1987 and 1988. However, it should be noted that these high returns drop considerably when a few IPOs having exceptionally high returns are excluded. The returns fall to 27.8% and 75.74% after the elimination of Ayudhya Life Assurance Co. Ltd and Finance One Public Co. Ltd in 1987 and 1988 respectively. Yet, this time period still is the best performer overall. This good performance is as expected since the two-year periods for these IPOs cover the period of the rising and booming market. However, the two-year adjusted returns for these two years after excluding an outlier are negative indicating the IPOs significantly underperform the market in the long run. The equally weighted adjusted return and value weighted adjusted return for 1988 after removing Finance One Public Co. Ltd are -60.94%and -3.94% respectively. Note that the worst two-year equally weighted adjusted return in 1987 is mostly driven by the performance of IPOs from the banking industry (the industry effect is discussed in the next section). IPOs listed during 1989 and 1990 also underperform the market in the long run. After excluding One Holding Ltd, the two-year return, equally weighted adjusted return and value weighted adjusted return for 1990 are -4.33%, -5.42% and -10.46% respectively. The aftermarket performances after adjusting for outliers are summarized in Table 7.

The increasing volume of IPOs during 1988–90 together with the exceptionally high initial returns followed by the long run underperformance even in the rising market appears to be consistent with the market fads hypothesis. Except for the two-year equally weighted adjusted return, there is evidence that the annual volume of IPOs is negative related to the aftermarket performance. The negative relation matches with Ritter's (1991) finding while the positive function of the two-year equally weighted adjusted return matches the results of Allen and Patrick (1994). The mixed results lead to an inability to reject hypothesis 4.

Table 7. Aftermarket performance categorized by year excluding outliers^a

Year	Numbers of IPOs	Initial return	Two-year return	Two-year equally weighted adjusted return	Two-year value weighted adjusted return
1987	3	19.86	27.8	- 296.81	- 179.02
1988	12	34.32	75.74	- 60.94	- 3.94
1989	20	157.83	-13.82	-15.84	-20.30
1990	23	72.43	- 4.33	- 5.42	-10.46
Mean (excluding outliers)		91.28	10.63	- 35.56	-21.22
Median (excluding outliers)		57.91	-16.38	- 28.72	- 25.98

Note: ^a Three utliers excluded from the 1987, 1988 and 1990 are Ayudhya Life Assurance Co. Ltd, Finance One Public Co. Ltd and One Holdings Ltd respectively.

Table 8. Aftermarket performance categorized by industry

Industry	Number of IPOs	Initial return	Two-year return	Two-year equally weighted adjusted return	Two-year value weighted adjusted return
Agribusiness (1)	11	86.59	- 35.48	- 59.66	- 50.63
Banking (2)	3	22.37	-16.24	-225.67	-153.37
Building and furnishing materials (3)	5	59.37	14.91	5.14	1.85
Chemicals and plastics (4)	3	28.46	- 4.26	- 64.50	- 47.04
Communication (6)	1	75.20	30.30	37.12	37.47
Electrical products and computer (7)	2	132.53	- 69.04	- 49.67	- 55.56
Electronic components (8)	1	190.77	-0.47	-0.59	-7.03
Energy (9)	1	120.83	45.04	-1.41	- 3.48
Finance and securities (11)	6	65.76	271.67	93.02	158.01
Foods and beverages (12)	3	110.14	108.09	-7.46	35.11
Health care services (13)	2	165.50	- 39.64	-22.09	-27.67
Hotels and travel services (14)	2	131.36	-40.67	- 55.28	- 63.06
Insurance (16)	4	115.01	224.21	109.03	164.93
Jewellery and ornaments (18)	1	65.71	- 39.93	-10.77	-16.56
Packaging (21)	4	59.42	17.79	-3.01	- 2.75
Pharmaceutical products and cosmetics (22)	1	-22.86	-14.84	- 54.29	- 55.82
Printing and publishing (23)	1	261.11	118.88	135.68	127.79
Property development (25)	4	215.09	28.82	30.52	20.56
Pulp and paper (26)	1	43.43	-50.10	- 43.15	- 44.28
Textiles clothing and footwear (27)	4	39.97	61.60	18.06	33.21
Transportation (28)	1	- 5.56	-0.28	-135.18	- 80.05
Warehouse and silo (30)	1	81.54	- 43.21	-14.15	- 17.62

Aftermarket performance categorized by industry. Table 8 groups IPOs by industry based on the industry index assigned by the Security Exchange of Thailand. The sample covers 22 out of 31 industries. However, note that some industries have only one IPO in the sample and these industries are excluded from the following analysis. Yet they will be included in the regression analysis where similar industries are grouped together.

Table 8 shows that the performance of IPOs in different industries varies widely. Excluding industries having one IPO, the property investment industry has the highest initial return (215.09%) while the banking industry has the lowest one (22.37%). The banking industry has the worst two-year adjusted returns (-225.67% and -153.37% for equally weighted and value-weighted respectively) whereas the finance and securities as well as insurance industry have the best long run performance. However, the long run returns of these best performers drop significantly when outliers are excluded. The two-year return and the two-year value weighted adjusted return of the finance and securities industry fall from 271.67% to 160.2% and from 158.01% to 57.55% respectively when Finance One Public Co. Ltd is dropped out. Those of insurance industry decrease from 224.21% to 92.74% and from 164.93% to 52.23% respectively when Ayudhya Life Assurance Co. Ltd is excluded. Likewise, the long run performance of several other industries is very sensitive to the exceptional performance of individual issues. After adjusting for such issues, the long run returns decline dramatically causing the long run returns in most industries to be negative. The wide variation in the long run performance and the underperformance in many industries are consistent with Ritter (1991). He interprets these results as being consistent with the fads hypothesis.

Aftermarket performance categorized by age. Ritter (1991) suggests that age seems to be a better proxy for *ex-ante* uncertainty than issue size. He finds that riskier issues, that is younger firms, have a higher initial underpricing. He also finds that the younger IPOs have the worse aftermarket performance and he concludes that this is consistent with investor overoptimism and fads hypotheses.

Table 9 reveals a tendency for age to be positively related to the initial underpricing, that is the younger firms have the lower initial return. This result contradicts Ritter's finding and the concept of a risk-return relationship. The long run return patterns are, however, not uniform since there appears to be outliers in some quintiles. The long-run returns after excluding some outliers are presented in Table 10.

Table 9. Aftermarket performance categorized by age^a

After excluding outliers, there is a more explicit pattern that age is negatively related to long run performance. That is the younger firms have the higher long run returns. The high two-year return of the fourth quintile appears to be due to some additional IPOs having outstanding performance. If these IPOs (Kiatnakin Finance and Securities Co. Ltd, Foremost Friesland (Thailand) Ltd and Capital Securities Co. Ltd) are excluded, the two-year return will fall to 2.34%. The negative relationship is consistent with the risk-return relationship. It, also leads to the inability to reject hypothesis 6.

Regression results

Univariate regression. Five variables assessed in the previous sections are used as the independent variables in simple regressions with the dependent variable; the two-year raw return. The results are shown in Table 11. A heteroscedastic problem has been detected and has been corrected using White's correction (White, 1980). Thus the standard error and *t*-statistic reported are White's heteroscedasticity consistent covariance matrix.

The results show that initial return, issue size and annual volume of IPOs have a significant negative effect on the

Ageª	Initial return	Two-year return	Two-year equally weighted adjusted return	Two-year value weighted adjusted return
3-5	89.59	32.89	1.77	6.90
6-9	92.46	33.57	10.77	18.42
10-14	95.66	-16.28	- 31.94	-27.31
16-24	55.53	121.97	17.34	51.03
26-53	118.09	37.14	- 58.28	-20.39
Mean (all)	88.93	42.80	-11.09	6.71
Median (all)	57.14	- 14.25	- 20.75	- 22.19

Note: "Age is computed as the year of the offer minus the year of founding.

Table 10. Aftermarket performance categorized by age excluding outliers^a

Age ^a	Initial return	Two-year return	Two-year equally weighted adjusted return	Two-year value weighted adjusted return
3-5	89.59	32.89	1.77	6.90
6-9	92.46	8.01	-19.37	-10.87
10-14	95.66	-16.28	- 31.94	-27.31
16-24	55.53	65.57	-24.81	4.16
26-53	118.09	-21.01	- 26.87	- 53.35

Note: ^aThe outliers for two-year return are One Holdings Ltd from quintile 2 Finance One Public Co. Ltd from quintile 4 and Ayudhya Life Assurance Co. Ltd from quintile 5 while One Holdings Ltd from quintile 2; Finance One Public Co. Ltd from quintile 4; Ayudhya Life Assurance Co. Ltd and Bangkok Bank of Commerce Ltd from quintile 5 are the outliers for the two-year adjusted return.

Table 11. Univariate regression results

Independent variables	Estimated coefficient	Standard error	Prob $ t > x$	R^2
Initial return	- 0.2973	0.0952	0.0018	0.03632
Market return	1.2593	0.2985	0.00008	0.2287
Issue size	- 0.5536	0.1971	0.00498	0.1426
Volume	-2.8001	1.124	0.01274	0.0731
Age	0.4742	0.7054	0.51298	0.0072

Note: The dependent variable is two-year return calculated as $2YRR_i = \prod_{t=0}^{24} (1 + r_{it}) - 1$ where r_{it} is the monthly return on *IPO_i*; *Initial return* is calculated as $r_i = (P_i/S_i) - 1$ where r_{mt} is the closing price on the first trading day of *IPO_i* and S_i is the subscription price of *IPO_i*; *Market return* is the two-year value weighted adjusted return calculated as $2YRRM_m = \prod_{t=0}^{24} (1 + r_{mt}) - 1$ where r_{mt} is the monthly market return; *Issue Size* is the Ln(Deflated gross proceeds) measured in Baht using 1990 purchasing power; Volume is Log(1 + number of IPO in each year); Age is Log(1 + age). The number of observations are 62 for all regressions except issue size. (The number of observations for issue size is 53 since there are some missing values.

aftermarket performance. The first two variables are significant even at the 1% level. On the other hand, market return and age have a positive effect on the long-run returns. The former factor is highly significant whereas the latter one is insignificant. Market condition appears to have the highest explanatory power on the long-run return followed by the size of the issue. Initial return and volume have rather low explanatory power. These regression analyses provide corroborative evidence to the aftermarket performance reported in the previous sections. Although, the estimated coefficient on age has the opposite effect to that of the cross-sectional results, it is not statistically significant.

Multivariate regression. Besides five variables examined in the simple regression, the dummy variables to capture industry effects were included in the multiple regression. Twenty-two industries in the sample were grouped into six categories as shown in Appendix III. Category 3 (agribusiness industry) is used as an omitted category. The multiple regression results are reported in Table 12.

The adjusted R^2 of the multiple regression is 0.3245 indicating that 32.45% of the variation in the long run return is explained by the whole set of explanatory variables. This explanatory power is rather high compared with the evidence reported by Ritter (1991) and Allen and Patrick (1994). Their adjusted R^2 are 7% and 15.05% respectively.

Initial return and issue size still have a highly significant negative effect on the two-year return. In contrast, the estimated coefficient on age becomes negative and significant. The signs of the estimated coefficient of the market return and volume are still the same; positive for the market return and negative for volume, but both of them become statistically insignificant. These results are opposed to those reported by Ritter as well as Allen and Patrick. They find that market return and annual volume has significant effect

Table 12. Multiple regression results with two-year return as the dependent variable (the number of observations are 53).

Independent variables	Estimated coefficient	Standard error	Prob $ t > x$	
Constant	11.6513	3.830	0.00235	
Initial return	-0.4744	0.1155	0.00004	
Market return	0.2888	0.6883	0.6748	
Issue size	-0.5494	0.1604	0.0006	
Volume	-0.0567	1.599	0.9716	
Age	-1.1514	0.5347	0.0313	
CAT1	2.2217	0.6625	0.0008	
CAT2	1.1605	0.2996	0.0001	
CAT4	0.4989	0.3010	0.0974	
CAT5	0.7681	0.2679	0.0041	
CAT6	1.6978	0.5568	0.0023	

while initial underpricing is insignificant. Ritter also reports the coefficient on age is positive and significant.

The alteration in the significance levels of the market return and volume may be caused by a multicollinearity problem. The correlation matrix in Table 13 shows that the market return has a fairly high correlation with the annual volume of IPOs. However, there are no significant changes in the significance level of both variables when either the market return or the annual volume of IPOs is excluded from the multiple regression.

The positive signs on the estimated coefficient of all dummy variables suggest that all IPOs in these categories outperform the IPOs in the omitted category; agribusiness industry. The estimated coefficient of all categories except for category 4 are highly significant. The category 4 is significant at 10% level. Overall, the financial institutions seem to have the best long-run performance. The superior performance in the financial institutions is mainly driven by IPOs for finance and securities; and insurance industries.

Table 13. Correlation matrix

	Initial return	Market return	Issue size	Volume	Age
Initial return	1				
Market return	-0.3602	1			
Issue size	-0.3182	-0.2200	1		
Volume	0.1615	-0.5588	0.1443	1	
Age	0.0003	0.3415	-0.0825	- 0.2933	1,

Table 14. Multiple regression results with two-year equally weighted adjusted returns and two-year value weighted returns as the dependent variable

	Two-year equally weighted adjusted return			Two-year value weighted adjusted return		
Independent variables	Estimated coefficent	Standard error	Prob $ t > x$	Estimated coefficient	Standard error	Prob $ t > x$
Constant	9.6798	3.6320	0.0077	11.6513	3,8300	0.0024
Initial return	-0.4074	0.1021	0.0001	-0.4744	0.1155	0.00004
Market return	-0.5576	0.4766	0.2420	-0.7112	0.6883	0.3015
Issue size	-0.5013	0.1518	0.0010	-0.5494	0.1604	0.0006
Volume	-0.6091	1.6120	0.7055	-0.0569	1.5990	0.9716
Age	-1.1857	0.5414	0.0285	-1.1514	0.5347	0.0313
CAT1	1.8771	0.5618	0.0008	2.2173	0.6625	0.0008
CAT2	1.1035	0.2839	0.0001	1,1605	0.2996	0.0001
CAT4	0.4871	0.2971	0.1010	0.4989	0.3010	0.0974
CAT5	0.7286	0.2485	0.0034	0.7681	0.2679	0.0041
CAT6	1.7771	0.5661	0.0017	1.6978	0.5568	0.0023

Similarly, the good performance of category 6 is largely driven by one IPO from the printing and publishing industry. Due to differences in the classification, the results cannot be compared with Wethyavivorn and Koo-smith.

Two additional multiple regressions with two-year equally weighted adjusted returns and two-year value weighted adjusted returns as the dependent variable are undertaken. The results in Table 14 show that there are no significant changes in the estimated coefficients when compared with the multiple regression results of the two-year return. The coefficient on the market return becomes negative but it, as well as the coefficient on volume, is still insignificant. However, the adjusted R^2 for both regressions are rather low; 7.02% for two-year equally weighted adjusted returns and 12.28% for two-year value weighted adjusted returns.

VI. CONCLUSION

This study examined the long run performance of Thai initial public offerings listed during 1985–92 and feasible explanations for their aftermarket performance. The average initial return for the sample of 151 IPOs is 63.49%. This

is similar to the figure reported by Wethyavivorn and Koosmith (1991). Yet, it is very high when compared with that of US, UK and Australian IPOs. This perhaps can be largely attributed to the difference in the institutional characteristics of these markets. The statistically significant -2.9%average market adjusted return at the end of the listing month suggests that the high initial underpricing is adjusted quickly in the early aftermarket.

The cumulative adjusted return at the end of three year anniversary is 10.02%, it is also not statistically significant. While there is no significant evidence that Thai IPOs underperform the market in the long run, removal of outliers from the cross-sectional analyses suggest that Thai IPOs may underperform the market in the long run on average. The aftermarket returns are higher when the value weighted adjusted return is used as the benchmark suggesting that smaller firms have the better performance. Again, the aftermarket performance is similar to that of Wethyavivorn and Koo-smith but contrasts those of Ritter (1991); Levis (1993); Aggarwal *et al.* (1993) and Allen and Patrick (1994). Further research, including more recent data on the Thai market, would help clarify these issues.

Cross-sectional analysis of the long run performance of IPOs provides contrasting evidence of the market

overreaction hypothesis. After excluding outliers, IPOs that have a higher initial return tend to have the worse aftermarket performance. This negative relationship is consistent with the overreaction hypothesis reported by Aggarwal and Rivoli (1990); Ritter (1991) and Levis (1993). However analysis in relation to the size of the issuing company to long run performance, reveals that smaller issues tend to perform better than larger issues in the long run. This finding is in contrast to the market overreaction hypothesis supported by Ritter (1991); Levis (1993). Yet, it is similar to the result of Allen and Patrick (1994).

With regard to evidence in relation to the market fads hypothesis, again the evidence with Thai IPOs is mixed. The increasing volume of IPOs during 1988–90 together with the exceptionally high initial returns followed by long-run underperformance even in the rising market appears to be consistent with the hypothesis. After removing outliers, there is similar evidence that the annual volume of IPOs is negative related to the two-year return and two-year value weighted adjusted return. In contrast, the relation for the two-year equally weighted adjusted return appears to be positive.

Analysis by industrial sector appears to be ambiguous with the performance of IPOs in different industries varying widely. The long run performance of several industries is very sensitive to the exceptional performance of individual issues. After adjusting for such issues, the long run returns in most industries become negative. The wide variation in the long run performance and the underperformance in many industries can be considered consistent with the fads hypothesis as reported by Ritter (1991). However, when considering the age of IPO firms, the relationship between age and initial underpricing is positive, and between age and long run performance is negative. That is the younger firms have lower initial returns but higher long run return. This relationship is not indicative of the market fads hypothesis.

Regression analyses provide some evidence supporting the previous results. Initial return, issue size and age are found to be significantly and negatively related to the aftermarket returns. The estimated coefficients on market return and annual volume of the IPOs, in contrast, are not statistically significant. While these results appear to be consistent with the market overoptimism and fads hypotheses, the ambiguous results from the cross-sectional analysis suggest that firm specifics have more effect on the long run performance than market conditions. It is suggested that perhaps further research, with more data over a three year period, would clarify whether or not the Thai IPO market exhibits characteristics consistent with these hypotheses.

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REFERENCES

- Aggarwal, R., Leal, R. and Hernanmdez, L. (1993) The aftermarket performance of initial public offerings in Latin America, *Financial Management*, **22**, 42–53.
- Aggarwal, R. and Rivoli, P. (1990) Fads in the initial offering market, *Financial Management*, 19 (4), 45-57.
- Allen, D. E. and Patrick, M. (1994) Some further Australian evidence on the long-run performance of initial public offerings: 1974–1984. Department of Finance and Banking, Curtin University of Technology.
- Agtmale, A. W. (1993) Thailand: from mini-market to leading emerging market, in *The World's Emerging Stock Markets*, K. H. Park and A. W. Agtmale (Ed.) Probus Publishing, Chicago.
- Anonymous (1994) Asian equity guide: Thailand, Asiamoney, March, 58-63.
- Balvers, R. J., McDonald, B. and Miller, R. E. (1988) Underpricing of new issues and the choice of auditor as a signal of investment banker reputation, *The Accounting Review*, 63 (4), 605–22.
- Baron, D. P. (1982) A model of the demand for investment banking advising and distribution services for new issues, *Journal of Finance*, 37 (4), 955–76.
- Banz, R. W. (1981) The relationship between return and market value of common stocks, *Journal of Financial Economics*, 9 (1), 3–18.
- Beatty, R. P. and Ritter, J. R. (1986) Investment banking, reputation, and the underpricing of initial public offerings, *Journal of Financial Economics*, 15 (1/2), 213–32.
- Booth, P. and Smith, C. J. (1986) Capital raising, underwriting and the certification hypothesis, *Journal of Finance*, **15**(1/2), 261-81.
- Chowdhry, B. and Sherman, A. (1996) International differences in oversubscription and underpricing of IPOs, *Journal of Corpo*rate Finance, 2(4), 359–81.
- Dawson, S. M. (1987) Secondary stock market performance of initial public offers, Hong Kong, Singapore and Malaysia: 1978-84, Journal of Business Finance and Accounting, 45(1), 65-76.
- De Bondt, W. F. M. and Thaler, R. (1985) Does the stock market overreact? *Journal of Finance*, **40**(3), 793-805.
- De Bondt, W. F. M. and Thaler, R. (1987) Further evidence of investor overreaction and stock market seasonality, *Journal of Finance*, 42 (3), 557–82.
- Finn, F. J. and Higham, R. (1988) The performance of unseasoned new equity issues-cum-stock exchange listings in Australia, *Journal of Banking and Finance*, **12** (3), 333–51.
- Hanley, K. W. and Ritter, J. R. (1992) Going public, in *The New Palgrave Dictionary of Money and Finance*, (Eds) P. Newman, M. Milgate and J. Eatwell, Stockton Press, London, pp. 248–255.
- Ibbotson, R. G. (1975) Price performance of common stock new issues, *Journal of Financial Economics*, 2(3), 235-72.
- Ibbotson, R. G. and Jaffe, J. (1975) Hot issue markets, *Journal of Finance*, **30** (4), 1027-42.
- Keloharju, M. (1993) Winner's curse, legal liability and the longrun performance of initial public offerings in Finland, *Journal* of Financial Economics, 34(2), 251–77.
- Leland, H. E. and Pyle, D. (1977) Information asymmetry, financial structure, and financial intermediaries, *Journal of Finance*, 32 (2), 371–87.
- Lian, D. C. B. (1993) Financial development in Thailand, Journal of Asian Business, 9 (4), 110-37.
- Levis, M. (1993) The long-run performance of initial public offerings: the UK experience 1980–88, *Financial Management*, 22(1), 28–41.

- Loughran, T., Ritter, J. R. and Rydqvist, K. (1994) Initial public offerings: International insights, Pacific-Basin Finance Journal, 2(2,3), 165-99.
- McDonald, J. G. and Fisher, A. K. (1972) New-issue stock price behaviour, Journal of Finance, 27(1), 97-102.
- Mustow, D. (1992) The long run performance of initial public offerings and some factors affecting that performance. Honours Dissertation, University of Melbourne,
- Reilly, F. K. (1973) Further evidence on short run results for new issues investors, Journal of Financial and Quantitative Analysis, 8(1), 83-90.
- Reilly, F. K. (1977) New issues revisited, Financial Management, 6(4), 28-42.
- Reilly, F. K. and Hatfield, K. (1969) Investor experience with new stock issues, Financial Analysts Journal, 25(5), 73-80.
- Research and Development Department, The Stock Exchange of Thailand (1994) The Stock Market in Thailand 1994, The Stock Exchange of Thailand, Bangkok.
- Ritter, J. R. (1984) The 'hot issue' market of 1980, Journal of Business, 57 (2), 215-40.
- Ritter, J. R. (1991) The long-run performance of initial public offerings, Journal of Finance, 46(1), 3-27.

- Rock, K. (1986) Why new issues are underpriced, Journal of Financial Economics, 15 (1/2), 187-212.
- Shiller, R. J. (1990) Speculative prices and popular models, Journal of Economics Perspectives, 4, 55-65. Stern, R. L. and Bornstein, P. (1985) Why new issues are lousy
- investments, Forbes, 136, 152-90.
- The Stock Exchange of Thailand and Chandler and Thong-ek Law Office Limited (1992) Rules, Conditions and Procedures Governing Listing and Delisting Securities, Stock Exchange of Thailand, Bangkok.
- Tinic, S. (1988) Anatomy of IPOs of common stock, Journal of Finance, 43(4), 789-822.
- Titman, S. and Trueman, B. (1986) Information quality and the valuation of new issues, Journal of Accounting and Economics, 8(2), 159-72.
- Wethyavivorn, K. and Koo-smith, Y. (1991) Initial public offers in Thailand, 1988-89: price and returns pattern, in Pacific-Basin Capital Market Research, Volume II (Eds.), S. G. Rhee, and R. P. Chang, Elsvier Science Publishers, North Holland, pp. 379-94.
- White, H. (1980) A heteroskedasticity consistent covariance matrix estimator and a direct test for heteroskedasticity, Econometrica, 48(4), 817-38.

APPENDIX I: LISTING REQUIREMENTS

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Q	Qualifications	Listed company	Listed company in a provincial zone	Infrastructure or basic industry (a newly established company)
1.	Registered capital in form of ordinary shares	≥ 60 million Baht	≥ 40 million Baht	≥ 60 million Baht
2.	Total market capitalization	≥ 500 million Baht	≥ 200 million Baht	\geq 500 million Baht
3.	Cash payment for ordinary shares in 1.	$\ge 75\%$ of the registered capital	Same as a listed company	Same as a listed company
4.	Distribution of ordinary shares 4.1 Number of small shareholders 4.2 Total shares held by small shares	 ≥ 600 shareholders ≥ 30% of registered capital 	≥ 300 shareholders≥ 20% of registered capital	≥ 600 shareholders $\geq 30\%$ of registered capital
	holder in 4			
5.	Nature of business	Main business is beneficial to economy and society	Same as a listed company	 -Having an investment in a basic infrastructure project with a concession period ≥ 20 years or - Operating in a large scale basic industry Project cost ≥ 10 000 million Baht Having the need to raise funds to commence the project Having an investment in a project by the promoters ≥ 50% of the paid up capital for the whole project Having a feasibility study
6.	Business operations 6.1 Operations	At least 3 years of operating track record under substantially the same management	 Same as listed company Having the main operation and most of the labour in provincial zone 	Having competent and experienced on management in finance, production and marketing
	6.2 Past financial status	Company profit - Year $1 \ge 5$ million Baht - Year $2 \ge 5$ million Baht - Last year before filing application ≥ 25 million Baht and total for the last three years ≥ 50 million Baht or profit for the last three years ≥ 80 million Baht	Profit for the most recent ye or for the last two years ≥ million Baht	ear 15

Source: The Stock Exchange of Thailand (1994, p. 19)

APPENDIX II: LISTING PROCEDURES



Source: The Stock Exchange of Thailand and Chandler and Thong-ek Law Office Limited (1992)

APPENDIX III: CATEGORIZATION OF IPOS BY INDUSTRY

Category	Industry	Number of IPOs	
CAT1: Financial Institutions	Banking (2) Finance and security (11) Insurance (16)	3 6 2	
CAT2: Real Estate developments	Property Development (25) Building and Furnishing Materials (3)	4 5	
CAT3: Agribusiness	Agribusiness (1)	8	
CAT4: Manufacturing	Chemical and Plastic (4) Electrical Products and Computers (7) Electronic Component (8) Energy (9) Packaging (21) Pharmaceutical Product and Cosmetic (22) Pulp and Paper (26) Textile and Footwear (27)	2 2 1 1 4 1 1 3	
CAT5: Services	Communication (6) Healthcare Service (13) Hotels and Travel Services (14) Warehouse and Silo (30)	1 2 2 1	
CAT6: Others	Food and Beverage (12) Printing and Publishing (23) Jewellery and Ornaments (18)	2 1 1	

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