

The Long-Run Performance of Initial Public Offerings in the Korean Stock Market

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I . Introduction

Using data regarding the stock markets of advanced nations such as US, the UK, France and Canada, many authors have documented that three anomalies, i.e., underpricing, underperformance and hot issue market, appear in the new issues markets. Of them, some authors¹⁾ have recently investigated the underpricing phenomenon of initial public offerings in emerging markets and then attempted to test empirically theories concerning pricing of initial public offerings using the data of the developing markets such as Korea, Hong Kong, Malaysia and Singapore. In general, the extent of underpricing of new issues in emerging markets appears greater than that of the developed markets.

In fact, most of the existing studies have attempted to examine the underpricing problem of new issues. But there are a few of studies on the long-term performance of initial public offerings (IPOs). Using the US IPO data, Ritter (1991) firstly explored the long-run performance of IPOs. And then Levis (1993) examined the stock price movement of the UK IPOs. Both of them found that the IPOs were overpriced over the long-term horizon.

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1) See Dawson(1987) on Hong Kong, Malaysia and Singapore ; Kim, Krinsky and Lee(1993) on Korea ; Koh and Walter(1989) and Lam(1991) on Singapore ; and McGuinness(1992 and 1993) on Hong Kong.

Considering this evidence, in this paper we will first focus on investigating the long-run performance of initial public offerings in the Korean new issues market. Then we will also examine the short-run underpricing phenomenon of the Korean IPOs. In comparison with the UK IPOs and the US IPOs, whether the Korean IPOs exhibit great differences in the magnitude of the short-run underpricing and show quite different patterns in the price behaviour of IPOs over the long-term horizon or not will be explored. In particular, the long-run performance of new issues will be examined through the cross-section and time-series analyses.

The organisation of this paper is as follows. Following the introduction, Section 2 discusses briefly the previous studies on the aftermarket performance of IPOs in the new issues market. Section 3 describes the data and methodology to be used in this paper. Section 4 deals with the empirical results on the short-run performance of IPOs. Section 5 presents the long-run performance of new issues through the cross-section and time-series analysis and Section 6 concludes the paper.

II . A Review of Previous Studies on the Long - Term Performance of IPOs

As summarised in Table 1, many studies found that in the short-run the initial public offerings show the positive excess returns in all the new issue markets. Observing the extent of underpricing of new issues by country, the advanced countries such as the UK, the USA, France, Canada exhibit relatively small abnormal return. However in Japan the excess returns realised at the first trading day show 53.3% and therefore the Japanese new issues are greatly underpriced compared to other industrialised markets. France which is using tender offers shows little underpricing of new issues.

On the other hand, the magnitude of underpricing of IPOs in the emerging markets, including Korea, Brazil and Singapore, is greater. Of the developing markets, in Hong Kong the initial public offerings are offered at less discount price, showing relatively small excess returns of 16.59%. In the Malaysian stock market displaying the average market adjusted return of around 167%, the shares of initial public offerings were priced very low relative to the expected market price.

The phenomenon of underpricing of new issues is well documented in numerous studies and then many authors put forward several theories to explain the underpricing of initial public offerings²⁾.

In the short-term, the shares of initial public offerings are found to be significantly underpriced, but more recently some studies have focused on examining the long-run performance of the shares of initial public offerings and have then documented that IPOs underform in the long-term relative to the overall market or matched portfolio. The results in Table 1 show that IPOs in all markets

2) Winner's curse by Rock(1986), certification hypothesis by Booth and Smith(1986), asymmetric information hypothesis by Grinblatt and Hwang(1989) and Welch(1989), implicit insurance hypothesis by Tinic(1988).

Table 1. Summary of Studies on Short-Run and Long-Run Performance of IPOs

Study	Sample Description		Estimated Short - Run Underpricing (%)	Estimated Long - Run Performance (%)
	Period	Size		
Kim & Lee(1989) : Korea	1984 - 86	41	37.0	-
Kim, Krinsky & Lee (1993) : Korea	7/1988 - 3/1990	177	57.54	-
Lim & Lee(1995) : Korea	1980 - 3/1990	331	47.38	- 2.48 (3 years)
Buck Land, Herbert & Yeomans(1981) : UK	1965 - 71	297	9.7	-
Levis(1993) : UK	1980 - 88	712	14.30	- 11.38 (3 years)
Ibbotson(1975) : US	1960 - 69	120	11.4	-
Ritter(1984) : US	1960 - 82	5,000	18.8	-
	1977 - 82	1,028	26.5	
	1977 - 82	703	16.3 (Cold Issue)	
	1980 - 81	325	48.4 (Hot Issue)	
Ibbotson, Sindelar & Ritter(1988) : US	1960 - 87	8,668	16.37	-
Aggarwal & Rivoii (1990) : US	1977 - 87	1,598	10.67	- 13.73 (1 year)
Ritter (1991) : US	1975 - 84	1,526	14.32	- 29.13 (3 years)
Aggarwal, Leal & Hernandez(1993) : Brazil	1980 - 90	62	78.5	- 47.0 (3 years)
Jog & Riding(1987) : Canada	1971 - 83	100	11.0	-
Husson & Jacquillat (1989) : France	1983 - 86	131	4.0	-
Uhlir(1989) : Germany	1977 - 87	97	21.5	- 7.41 (1 year)
McGuinness(1993) : Hong Kong	1980 - 90	92	16.59	- 18.26 (2 years)
Hiraki(1985) : Japan	1979 - 84	108	53.33	- 2.33 (1 year)
Dawson(1987) : Malaysia	1978 - 83	21	166.6	18.2 (1 year)
Koh & Walter(1989) : Singapore	1973 - 87	66	27	-

Note : OS : offer for sales
 PL : placings.

except Malaysia were overpriced in the context of the long-term performance.

In recent years Lim and Lee(1995) examined the long-run performance of IPOs in the Korean stock market using data of 331 firms going public between 1980 and 1990. They found that Korean IPOs also exhibited the underperformance in the long-term with the disappearance of the over-optimism as the time goes by. That is, the Korean IPOs which showed positive excess return in the short-run underperformed presenting CAR of - 2.48% by the end of the third anniversary.

II. Data and Methodology

1. Sample Design

Since the mid-1980s, a large number of firms have been newly admitted to list on the Korean stock market. In particular, over the sample period from 1986 to 1990, 343 companies have gone public through offering new issues or selling their outstanding shares to the public. As presented in Table 2, we selected initial public offerings of 308 firms as our sample of these new issues. This represents around 90 per cent of the totality of firms which went public during the same period.

We confirmed our sample companies from Monthly Bulletin of Securities Supervisory Board and Stock of Korea Stock Exchange. Basic data for empirical analyses were collected from these two sources, Securities Finance of Korea Securities Finance Corporation and IPO related statistics provided by the research department of Shin Young Securities Co. Ltd. and the underwriting department of SSangyong Investment & Securities Co. Ltd. The share price for each issue was collected from 'Stock Price Database' of Coryo Securities Co. Ltd. Daily share prices were collected over the first 50 days after listing in order to examine the short-term performance of IPOs and also monthly prices were collected over 2 years so as to investigate the long-term performance of IPOs.

Table 2. Summary of the Korean IPOs Sample

Year	Sample IPOs	Mean Paid - in Capital(100mil. won)	Mean Subscription Times
1986	10	131.45	57.46
1987	32	140.02	114.00
1988	107	96.06	64.00
1989	119	149.97	32.53
1990	40	74.77	39.55
Total	308	119.84	53.64

2. Estimation of Excess Returns

In order to examine the evidence of market discount of new issues we computed the underpricing of shares of initial public offerings in the following way. That is, the underpricing of initial public offerings was estimated by computing the post-issue abnormal returns³⁾. Using the market adjusted returns approach⁴⁾, the ex post abnormal returns of individual new issues, AR_{it} , are estimated in the following way :

3) The abnormal return for a given security in any time period t is defined as the difference between its realised ex post return and that which is predicted under the assumed return - generating process.

4) There are three general models in measuring abnormal performance : mean return approach, market - adjusted return approach, and market and risk - adjusted return model(Brown and Warner(1980), pp. 207 - 208). In their empirical study, the market - adjusted model is used and this model is the most common approach employed in many studies.

$$AR_{it} = R_{it} - R_{mt} \quad (1)$$

where, R_{it} is the realised rate of return of new issues of individual companies at time t and R_{mt} is the realised rate of return of market at time t . We used Korea Composite Stock Price Index as the proxy for the market index.

The market - adjusted returns of individual firms calculated by equation (1) are averaged across firms to compute average abnormal returns(AAR_t) (see equation (2)). The long - term performance of IPOs in the Korean stock market is investigated through observing monthly cumulative abnormal returns over two years. Cumulative abnormal returns (CAR_{it}) for each issuing firm and cumulative average abnormal returns (CAAR_t) across firms over time are calculated by equations (3) and (4), respectively. This market adjusted model assumes that the beta of the portfolio of sample firms is equal to that of the market portfolio. AAR_t and CAAR_t will be used to examine the underpricing of unseasoned new issues and to analyse the aftermarket performance of initial public offerings over time. We compute and test abnormal returns with Lotus and SPSS/PCT.

$$AAR_t = \frac{1}{n} \sum_{i=1}^n AR_{it} \quad (2)$$

$$CAR_{it} = \sum_{t=T_1}^{T_2} AR_{it} \quad (3)$$

where, T_1 is the beginning day(day 1 or month 1) and T_2 is the ending day(day 50 or month 24) in the calculation of CAR_{it}.

$$CAAR_t = \frac{1}{n} \sum_{i=1}^n CAR_{it} = \frac{1}{n} \sum_{i=1}^n \sum_{t=T_1}^{T_2} AR_{it} \quad (4)$$

IV. Underpricing of IPOs in the Korean New Issues Market

The short-term underpricing of initial public offerings in the Korean IPOs market is shown in Table 3. Underpricing of initial public offerings in Korea, measured on the basis of the first day market adjusted excess return, shows 73.78%⁵⁾. This is statistically significant and nearly more than five times the UK and US figures(see Table 1). But the large magnitude of underpricing of the Korean IPOs is similar to that of 78.5% in Brazil. The underpricing extent of 73.8% of Korean IPOs is less than that of Malaysian IPOs but larger than those of Hong Kong and Singapore IPOs. The positive excess returns appear up to 24 days from listing and they are statistically significant at a conventional level. This phenomenon might raise questions about the efficiency of stock market.

5) Hiraki(1985) estimated a magnitude of underpricing of 53.3% for 108 Japanese unseasoned new issues listed on the Tokyo, Osaka, and Nagoya Stock Exchanges between May 1979 and October 1984. This is much greater than that of underpricing in the UK and the US.

Table 3. Changes of Abnormal Returns for the First 50 Days

DAY	AAR	t(AAR)	CAAR	MEDN	STD	Q1	Q3
1	73.78	15.35	73.78	48.09	84.33	22.02	88.93
2	2.39	12.09	76.17	3.40	3.48	0.10	4.93
3	1.75	8.55	77.92	2.32	3.59	-0.55	4.75
4	1.57	8.26	79.49	1.45	3.33	-0.60	4.44
5	1.25	6.61	80.74	0.89	3.31	-1.09	4.25
6	1.04	6.21	81.78	0.67	2.95	-0.92	3.31
7	0.92	5.390	82.70	0.62	3.03	-0.90	3.46
8	0.71	3.80	83.41	0.33	3.28	-0.94	2.85
9	0.67	4.42	84.07	0.40	2.64	-0.85	2.15
10	0.46	2.99	84.53	0.24	2.72	-1.01	1.84
11	0.52	3.21	85.05	0.25	2.84	-1.11	2.35
12	0.55	3.99	85.60	0.15	2.43	-0.88	1.96
13	0.43	2.79	86.04	0.15	2.74	-1.21	1.69
14	0.62	4.74	86.66	0.47	2.31	-0.73	1.66
15	0.33	2.36	86.99	0.27	2.42	-1.05	1.45
16	0.36	2.75	87.35	0.10	2.30	-0.95	1.07
17	0.39	3.13	87.74	0.15	2.19	-0.80	1.20
18	0.35	2.80	88.09	0.08	2.20	-0.89	1.02
19	0.39	2.50	88.48	0.27	2.71	-0.91	1.50
20	0.44	3.62	88.92	0.31	2.14	-0.85	1.41
22	0.07	0.44	89.35	0.12	2.73	-1.02	1.20
24	0.41	3.27	89.98	0.24	2.20	-0.87	1.48
26	0.18	1.34	90.51	0.30	2.38	-0.89	1.29
28	-0.05	-0.39	90.72	-0.08	2.22	-1.38	0.96
30	-0.23	-1.53	90.50	0.01	2.59	-1.31	0.95
32	0.08	0.72	90.68	0.10	2.01	-1.16	1.04
34	0.09	0.81	90.98	0.04	1.96	-1.16	0.93
36	-0.19	-1.61	90.56	-0.20	2.05	-1.22	0.86
38	0.17	1.22	90.71	0.21	2.46	-0.74	1.03
40	0.18	1.37	90.90	0.06	2.33	-0.73	1.04
42	0.21	2.05	91.23	0.22	1.80	-0.94	1.05
44	0.03	-0.25	91.50	0.10	1.91	-0.87	0.79
46	-0.15	-1.47	91.37	-0.21	1.82	-1.25	0.83
48	0.08	-0.82	91.19	-0.01	1.74	-1.15	0.86
50	0.10	-1.13	91.00	-0.09	1.60	1.09	0.81

However, from day 24 onwards, most average excess returns appear not to be significant. In comparison with US and UK, the excess returns of IPOs in Korean stock market last over the longer time horizon. This phenomenon would be influenced by the existence of daily price limit in the secondary market and by the information asymmetry.

In addition, Figure 1 shows that the average abnormal returns decreased greatly and adjusted to the market price following listing on the market. This adjusted phenomenon appears pronounced since 1988 in which the limit of fluctuation of market prices of IPOs of equity had been changed⁶⁾. Such regulation change might considerably affect the extent of underpricing and aftermarket performance of initial public offerings.

Figure 2 displays the distribution of the first day market adjusted returns of initial public offerings in Korea. Compared with the distribution of underpricing of UK IPOs, the distribution of first day abnormal returns of Korean IPOs is more positively skewed. This evidence could be confirmed through looking at the number of issues showing negative returns on the first day. According to

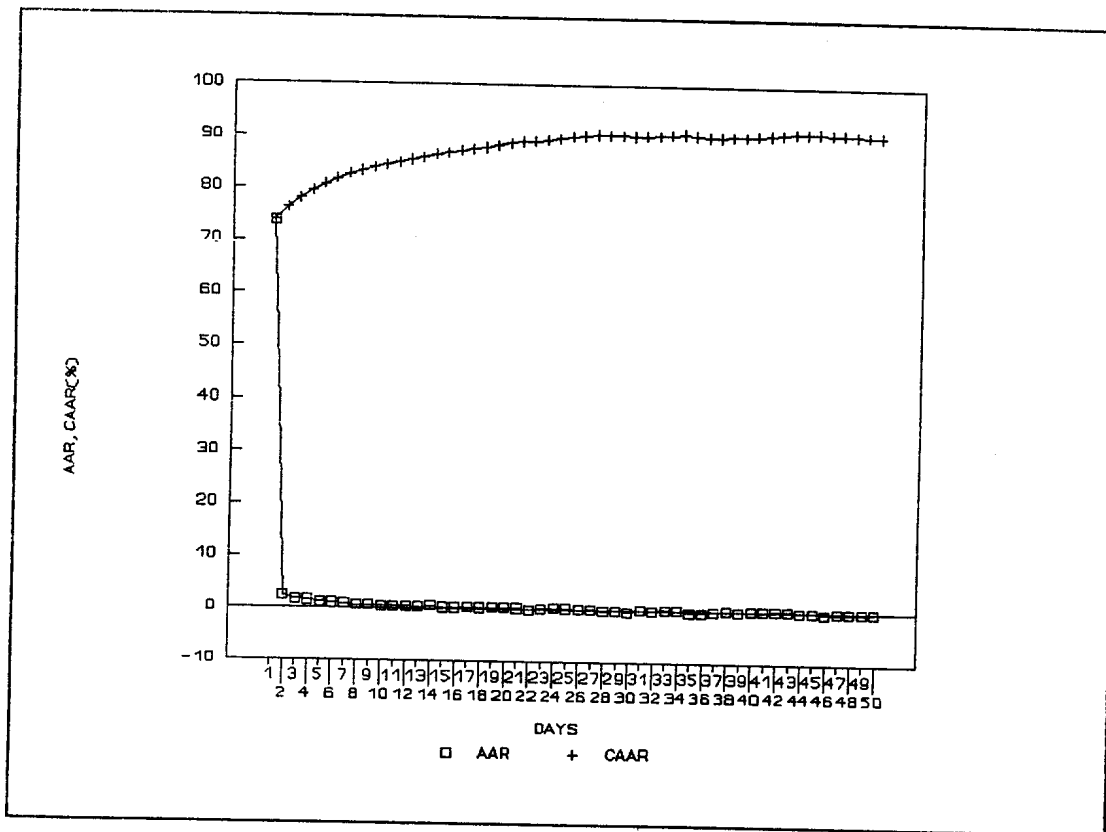


Fig. 1. Change of AAR and CAAR for the First 50 Days after Listing

6) Until the end of 1987, the market price of the first day of listing of new issues is established on the basis of the offering price. On the other hand, from January 1988 on, the market price of first trading day of IPOs is established by the opening price.

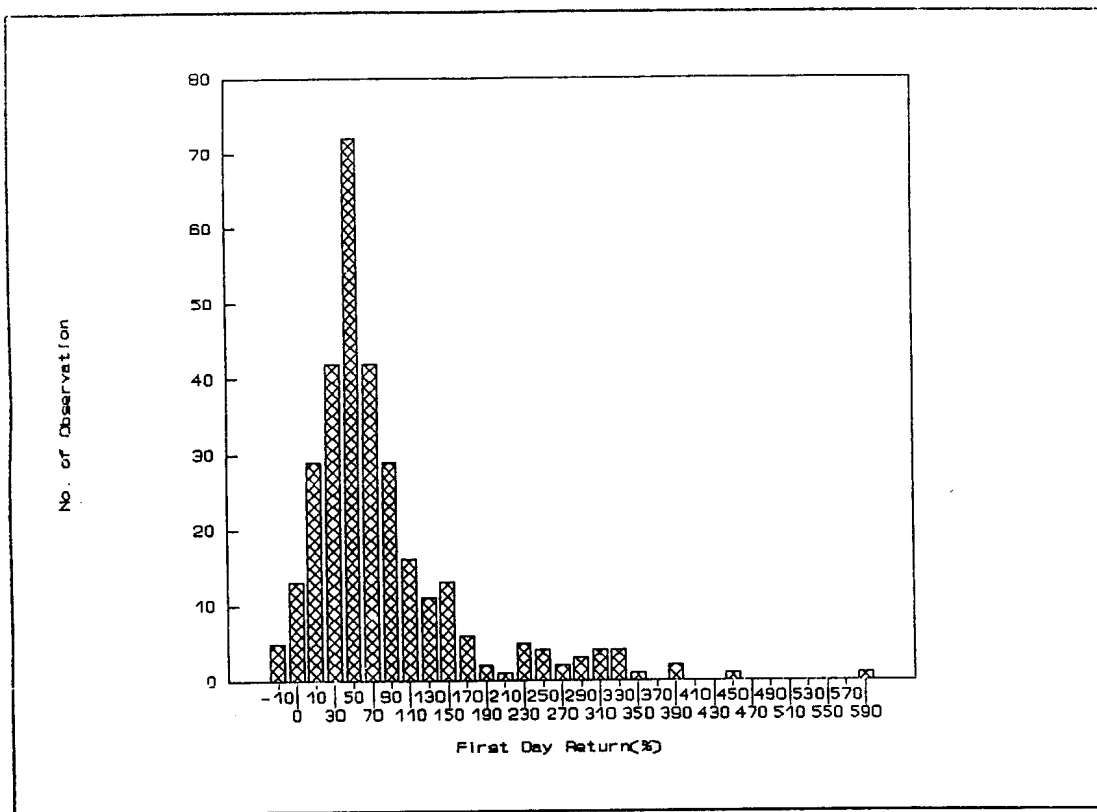


Fig. 2. Distribution of First Day Excess Returns

Table 4. Analysis of IPOs which Experienced Positive or Negative Return on Listing Day

Year	IPOs with Positive Initial Returns		IPOs with Negative Initial Returns		Total	
	No. of Issues	AAR	No. of Issues	AAR	No. of Issues	AAR
1986	5	8.45	5	-4.70	10	1.88
1987	23	7.52	9	-7.59	32	3.27
1988	105	136.27	2	-0.90	107	33.71
1989	119	55.35	-	-	119	55.35
1990	38	45.60	2	-13.09	40	42.66
Total	290	78.77	18	-6.65	308	73.78

Table 4, only 18 firms experienced negative first day return by overpricing of 6.65% and this corresponds to 5.8% of the entire sample⁷⁾. This implies that the investors who received successfully the share of IPOs could enjoy the positive excess returns in the short-term.

7) In contrast to the UK new issues of which 88 issues (17.2%) of the entire sample companies of 512 experienced negative initial excess returns going public between 1985 and 1990 (see Lee (1995)). In Germany only 8 issues (8.2%) of all sample initial public offerings of 97 between 1977 and 1987 were overpriced as measured by the first day market adjusted excess return. (Uhlir (1989)).

V. The Long-Term Performance of the Korean IPOs

Unlike the US and the UK, the long-term performance of the Korean initial public offerings showed substantial positive excess returns(measured as CAAR) until the second anniversary after initial quotation. However the magnitude of cumulative excess returns of initial public offerings excluding the initial returns decreases over the long-term horizon.

1. Aftermarket Performance

An examination of abnormal returns over 24 month(2 years) after listing on the Korean stock market was conducted, using the market-adjusted returns computed on the basis of prices of issuing firms at the end of the listing month. The abnormal return of month one was calculated by the difference between share price at the end of the listing month and share price at the end of second month after listing.

As reported in Table 5, the extent of average abnormal returns in month 1 after listing is 14.55%

Table 5. Changes of AAR and CAAR over 24 Months

MON	N	AAR	t(AAR)	CAAR	MEDIAN	STD	Q1	Q3
1	302	14.55	5.48	14.55	1.23	46.62	-6.87	11.54
2	308	-0.30	-0.39	14.25	-1.26	13.45	-8.78	6.34
3	308	-0.84	-1.38	13.42	-0.29	10.66	-5.89	3.38
4	308	-0.46	-0.73	12.96	-0.43	11.04	-6.61	5.46
5	308	1.97	3.14	14.92	1.90	11.00	-4.85	8.07
6	308	0.47	0.68	15.39	-0.37	12.07	-5.42	5.15
7	308	0.43	0.79	15.82	-0.25	9.44	-4.74	4.86
8	308	0.70	1.25	16.51	0.22	9.75	-4.60	5.95
9	308	0.33	0.66	16.84	0.56	8.81	-4.89	5.10
10	306	-0.91	-1.52	15.94	-1.99	10.46	-6.20	4.85
11	306	-1.77	-3.73	14.18	-2.08	8.28	-6.92	2.79
12	301	-1.14	-2.38	14.14	-1.03	8.30	-6.11	3.69
13	300	-0.14	-0.28	14.27	0.22	8.54	-4.76	4.72
14	296	0.21	0.41	14.79	-0.11	8.80	-4.88	4.62
15	290	0.49	0.91	16.06	-0.22	9.08	-4.83	5.86
16	290	0.32	0.63	16.38	0.44	8.54	-4.64	5.45
17	287	-0.06	-0.13	17.00	0.19	7.69	-4.76	5.12
18	279	0.00	0.00	18.57	-0.34	8.09	-5.11	5.11
19	278	-0.29	-0.58	18.32	-0.12	8.45	-5.29	5.19
20	268	-0.96	-1.70	19.19	-0.49	9.30	-5.96	3.98
21	254	-0.60	-1.37	19.86	-0.82	6.98	-4.94	4.56
22	232	-1.04	-1.77	20.10	-0.05	8.91	-5.60	3.95
23	229	-2.50	-4.23	18.19	-2.25	8.94	-7.14	2.90
24	210	-0.88	-1.29	19.56	-0.35	9.94	-7.77	4.17

with a statistical significance at 1%. The following 3 months present negative average abnormal returns but they are not statistically significant. Of the whole 24 months, 14 months show negative average market-adjusted returns. Of these 14 months, the mean excess returns of 5 months are statistically significant at a conventional level and the rest of them do not have statistical significance. Furthermore, monthly average returns are positive for 10 months and only two months show statistically significant returns.

On the other hand, as in Figure 3, over 24 months the positive cumulative returns do not disappear. These persistent positive returns imply that those investors who are successful applicants for initial public offers or bought new issues on the first trading day or at least within one month after listing could obtain positive excess returns. However taking into account the fact that average market-adjusted returns show negative excess returns over several months, the investors who bought new issues in the secondary market after the passage of two months after listing could not obtain positive rate of returns.

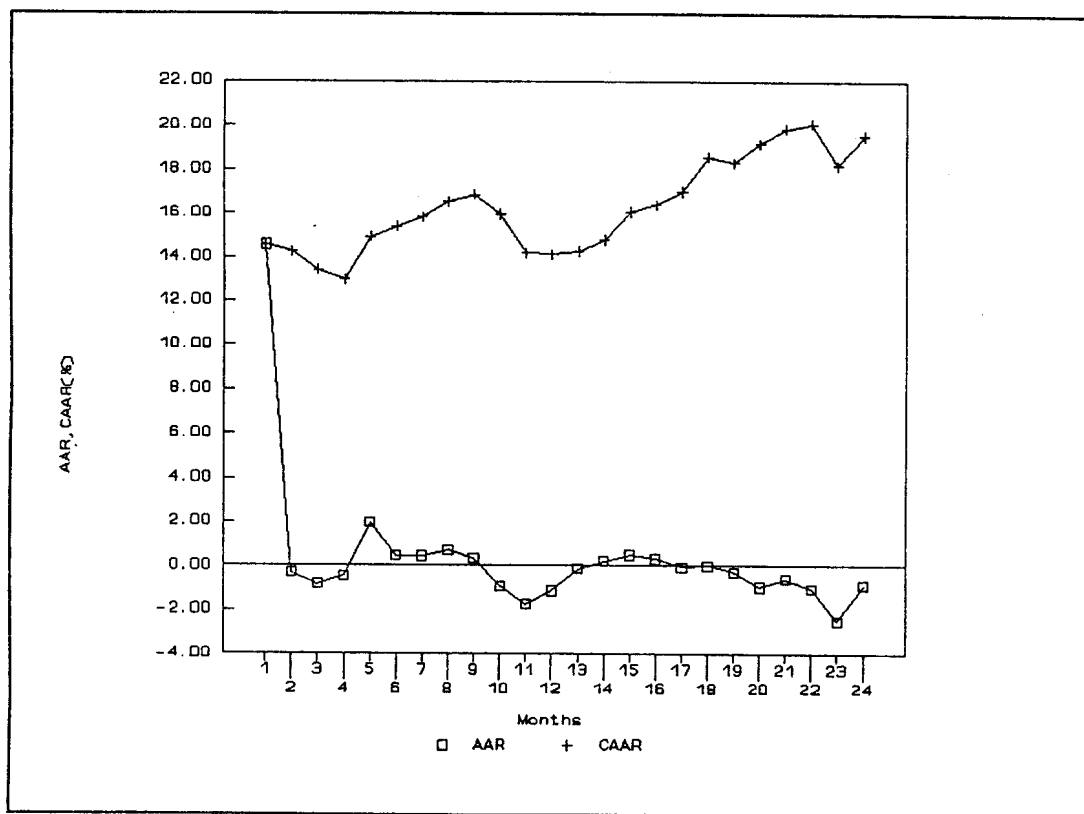


Fig. 3. Changes of AAR and CAAR for 24 Months after Listing

2. Cross - Sectional and Time - Series Analysis of the Long - Term Performance

In the following sections, we will focus on analysing cross - sectional and time-series characteristics of the long-run performance of the Korean IPOs according to each category such as method of issue, industry, proceeds, offer price, age of firms.

1) Aftermarket Performance by Method of Issue

Table 6 reports the result of investigation of the short-run underpricing and the long-run performance of initial public offerings by the method of issue. As can be seen from Table 6, the method of issuing new shares is dominant in the Korean IPOs market and the magnitude of underpricing of IPOs by this method is 81.3% and this figure is greater than that of IPOs by other methods. IPOs of firms issuing new and founder shares(combination of two methods) showed their average market-adjusted returns of around 60% on the first trading day. In contrast, firms going public through selling only old shares are rare and they show least underpricing of 32.8%.

The differences in underpricing among these three methods could be explained from the following viewpoints. First, it is suggested that the firms issuing existing(founder) shares do not signal they have promising new investment opportunities. Therefore these issuing firms might not attract investors' interest and corresponding demand in the market. As a result, share prices might not rise in the secondary market. Secondly, this evidence might shed light on signalling theory in which the fraction of shares retained by the entrepreneur is positively related with the value of firm⁸⁾. The selling of shares by the existing share holder would negatively affect the aftermarket performance of new issues.

Table 6. Long - Term Performance by Method of Issue

Method	AAR (%)		CAAR (%)		Sample Size		
	First Day	First Month	Year 1	Year 2	AAR	Yr 1	Yr 2
Offerings of new shares	81.33	121.25	16.37	25.20	210	203	146
Sales of old shares	32.79	64.74	25.68	5.36	6	6	5
Combination of both	59.21	69.75	8.45	6.81	92	92	59
Total	73.78	104.70	14.14	19.56	308	301	210

2) Aftermarket Performance by Industry

Table 7 presents the initial return and the long-run performance for each industry. In the short-run, the finance industry shows the greatest excess returns, following finance the construction and fabricated metal manufacture exhibit large returns while fishing, mining and non-metallic mineral

8) See Grinblatt and Hwang(1989).

Table 7. Long - Term Performance by Industry

Industry	AAR (%)		CAAR (%)		Sample Size		
	First Day	First Month	Year 1	Year 2	AAR	Yr 1	Yr 2
Fishing & Mining	34.74	36.89	- 0.45	- 16.14	4	4	3
Foods & beverages	65.69	95.28	8.84	0.20	10	10	9
Textiles	63.89	73.18	3.82	- 8.87	32	31	18
Wood & wood products	63.33	71.04	18.46	35.33	5	5	4
Paper & paper products	50.99	82.78	0.41	13.07	14	14	9
Chemicals	54.78	77.79	9.47	10.83	45	44	32
Non - metallic minerals	27.19	30.54	- 18.74	- 50.51	5	4	2
Basic - metal manufacture	50.88	90.50	8.75	9.91	17	17	10
Fabricated - metal manufacture	78.11	131.88	29.08	41.18	87	84	64
Other manufacture	24.43	68.56	43.63	12.93	3	3	3
Construction	99.99	125.16	23.20	39.93	12	12	4
Wholesale Trade	61.82	68.08	- 5.41	5.70	34	33	21
Transport & storage	51.18	62.61	7.99	0.55	4	4	2
Finance	139.19	176.44	21.00	26.07	36	36	29
Total	73.78	104.70	14.14	19.56	308	301	210

Note : The industry classification is based on the classification of the Korea Stock Exchange.

sectors show relatively low returns. The construction and metal manufacture show persistent positive cumulative returns in the long-run, although the size is not greater. The long-run abnormal returns of the finance industry are small after high initial excess returns. Fishing, textiles, and non-metallic sectors underperformed, exhibiting negative abnormal returns. Thus, the difference between the pattern of initial returns and the long-term performance in each industry implies inconsistent and over-reactive behaviour on the part of investors in the Korean IPOs market.

3) Long-Term Performance by Offer Size and Offer Price

An negative relationship between the size of issues and the extent of underpricing has been documented by many studies⁹⁾. As can be seen from Table 8, our findings of a negative association between gross proceeds and the short-run underpricing of IPOs in Korea is consistent with Ritter(1991) on the US new issues market. Several authors¹⁰⁾ also found that in the secondary market smaller firms tend to yield higher return than large firms. It is argued that this evidence reflects the limited information available on small - sized firm, compared to the disclosed data on large firms. This fact could lead to the wide asymmetry in information between the public investing

9) See Ritter(1991).

10) See Banz(1981), Keim(1983), Hess and Bhagat(1986), etc.

Table 8. Long - Term Performance by Proceeds

Proceeds(100 mil. won)	AAR (%)		CAAR (%)		Sample Size		
	First Day	First Month	Year 1	Year 2	AAR	Yr 1	Yr 2
under 15	104.09	172.83	41.39	43.07	53	53	48
15 - 24.9	83.35	110.88	4.33	- 0.35	59	57	44
25 - 34.9	68.07	80.07	- 4.61	4.94	33	31	17
35 - 50	64.21	81.98	17.57	28.77	52	50	32
51 - 99	67.12	84.88	7.14	19.59	54	53	33
100 - 200	59.76	104.09	21.53	21.23	34	34	25
over 200	45.51	65.92	- 2.81	- 11.47	23	23	11
Total	73.78	104.70	14.14	19.56	308	301	210

group and the inside investor of the firm. Small firms therefore are riskier than large companies and hence outperform as uncertainty is resolved.

In order to attract the investors, small firms have to leave enough money on the table to provide higher returns for the investor. However in the long-term, it is difficult to find a certain relation between the performance and issue size.

Until the mid-1980s the offer prices of almost all IPOs in Korea were set at the par value without considering the expected market price. Such rigid pricing produced high excess returns with few negative returns. The result of Table 9 shows that there is a negative association between underpricing and the level of premium rates of offer price over par value. This evidence is similar to the results of Young and Zaima(1986) and Chalk and Peavy(1987).

Companies realising high initial excess returns also tend to offer positive long term excess returns even though these are small by the end of year 2.

Table 9. Long - Term Performance by Premium Rate of Offer price

Range of premium rates(%)	AAR (%)		CAAR (%)		Sample Size		
	First Day	First Month	Year 1	Year 2	AAR	Yr 1	Yr 2
0	146.49	22.09	45.87	45.25	41	41	41
10 - 50	119.23	171.24	21.90	20.62	47	47	46
60 - 100	74.47	109.98	15.33	21.68	72	71	58
110 - 150	46.93	59.88	2.04	0.83	37	34	19
160 - 200	40.13	47.54	6.50	7.56	71	69	27
over 200	27.14	39.56	- 6.68	- 9.12	40	39	19
Total	73.78	104.70	14.14	19.56	308	301	210

4) Long-Term Performance by Initial Return Extent and Standard Deviation

Table 10 exhibits the history of seasoning of first day market-adjusted returns of IPOs in the secondary market. A negative relationship between the initial returns and the long-term performance was revealed from this table. The group with the lowest initial returns shows the highest market-adjusted return in the long-run. In contrast, issues with the highest initial returns exhibit negative returns by the end of the second anniversary. This result is similar to the findings of Ritter(1991) on the US market and this implies that the investors who are applying for new issues in the stock market are over-optimistic. This over-optimistic phenomenon disappears as the length of time after trading passes and therefore the overreaction hypothesis could be employed in explaining the difference between initial return and the long-run performance.

Table 10. Long - Term Performance by Size of Initial Returns

Initial Returns (%)	AAR (%) (First Day)	CAAR (%)		Sample Size		
		Year 1	Year 2	AAR	Yr 1	Yr 2
less than 0.0	- 6.65	79.24	82.12	18	17	16
0.02 - 18.70	9.91	36.40	54.93	54	54	40
20.82 - 39.79	30.63	2.00	- 8.00	48	46	17
40.10 - 59.46	48.45	3.12	12.62	67	66	32
60.28 - 98.59	76.54	7.41	1.50	52	51	421
100.84 - 184.29	130.86	10.37	11.48	41	39	36
over 200.00	294.49	- 4.89	- 5.22	28	28	28
Total	73.78	14.14	19.56	308	301	210

The standard deviation¹¹⁾ of the daily market-adjusted returns is employed as a surrogate of risk in exploring the association between risk and return. As expected, in the short-term, the greater the standard deviation, the higher the market adjusted returns(See Table 11). This finding is simi-

Table 11. Long - Term Performance by Standard Deviation

Standard Deviation	AAR (%)		CAAR (%)		Sample Size		
	First Day	First Month	Year 1	Year 2	AAR	Yr 1	Yr 2
1.49 - 4.98	10.61	87.99	37.07	53.79	94	92	63
5.01 - 9.97	47.52	58.48	3.02	8.41	109	106	52
10.03 - 14.93	85.05	103.70	5.52	1.33	43	41	35
16.20 - 23.86	133.58	147.53	12.66	12.37	32	32	30
25.82 - 82.53	287.13	280.66	- 3.55	- 4.52	30	30	30
Total	73.78	104.70	14.14	19.56	308	301	210

11) We calculate standard deviation of market adjusted returns over 50 days after listing.

lar to that of Ritter(1984). However this relation appears to be just the opposite in the long-term, that is, there seems to be a weak reverse association between standard deviations and cumulative returns.

To summarise, the evidence both on the relation between initial returns and cumulative returns and on the association between uncertainty and returns may shed light on the implication of the overreaction hypothesis for Korean IPOs market.

5) Long-Term Performance by Age of Firm

One explanation advanced for underpricing of initial public offerings is uncertainty, proxied by the age of issuing firms. The longer the business history the more information is available to market participants. In general, uncertainty for older firms would be reduced and the more accurate valuations can be made. The extent of initial returns of the older firms should therefore be smaller than that of new issues of young firms.

Table 12 presents the relation between age of companies going public and the initial excess returns and cumulative market-adjusted returns over 2 years since listing on the secondary market. In the short-term, the magnitude of underpricing of initial public offerings is inversely associated with the passage of time from incorporation. This evidence is similar to the findings of Young and Zaima(1986), Muscarella and Vetsuypens(1990), and Ritter(1991). However Keasey and Short (1992) found no significant age effect in the UK IPOs market.

By the end of year 2 though, the initial effects are reversed with young firms presenting the highest initial abnormal return and showing the worst long-term performance.

6) Long-Term Performance by Year of Issuance

In Korea from the mid - 1980s many privately-owned companies began to go public with the beginning of the bull market. Between 1980 and 1984, only 20 firms went to the new issues market. In contrast, from 1985 to 1990 around 340 new firms were listed on the Korean stock market.

Table 13 reports the patterns of initial returns and cumulative excess returns over 24 months by year of issuance. Based on the first month returns, the extent of initial abnormal returns in 1987 is

Table 12. Long - Term Performance by Age

Age (years)	AAR (%)		CAAR (%)		Sample Size		
	First Day	First Month	Year 1	Year 2	AAR	Yr 1	Yr 2
under 10	108.96	128.51	13.03	7.41	55	51	36
10 - 15	68.98	108.69	20.21	25.09	105	103	74
16 - 20	59.84	87.99	7.38	16.31	59	59	37
21 - 30	67.44	101.40	14.78	29.23	52	52	39
over 30	66.27	88.89	8.47	10.03	37	36	24
Total	73.78	104.70	14.14	19.56	308	301	210

Table 13. Initial Returns and Long - Run Performance by Year of Issuance

Year	ARR		CAAR		Sample Size			Total Firms Newly Listed on Market
	First Day	First Month	Year 1	Year 2	AAR	Yr 1	Yr 2	
1986	1.88	129.54	93.86	70.16	10	10	10	17
1987	3.27	166.12	66.81	78.67	32	32	32	35
1988	133.71	139.59	6.94	10.32	107	107	107	115
1989	55.35	71.95	7.48	- 3.53	119	119	61	124
1990	42.66	53.43	- 13.77	-	40	33	-	43
Total	73.78	104.70	14.14	19.56	308	301	210	334

the highest and that of 1988 comes next with 1986 also reaching nearly 130%. 1986 and 1987 show relatively high cumulative returns over 2 years even though the magnitude is reduced to nearly half of the initial excess returns. However the cumulative excess returns in 1988, 1989 and 1990 show small positive or negative returns. This is caused by the overreaction of investors and the declining of the Korean stock market.

VI. Conclusions

The investigation of pricing and aftermarket performance of Korean IPOs provides different result from the findings on IPOs market of the industrialised countries. First of all, the magnitude of underpricing of initial public offerings in Korea is much greater than in the UK, the US, and Singapore. This great underpricing of IPOs originates from inefficient pricing caused by rigid regulation. The large initial returns decrease with the passage of time following first listing. The average abnormal returns begin to disappear from day 26 after listing, although the cumulative returns are significant. The evidence is that even by the end of the second anniversary after first trading, positive cumulative returns persist in direct contrast with the patterns of the UK and the US IPOs.

The size of initial returns and cumulative excess returns over 24 months show differences according to method of issue, industry, issue size, offer price and age of the issuing firms. The different pattern between the short - run return and the long-run return could be explained from the perspective of overreaction hypothesis. That is, the investors who bought shares in the IPOs market would tend to be willing to pay much money when they apply for new issues in the market. This implies that the investors are inclined to be over-optimistic about new issues. This could be proved by observing higher subscription times on the shares of IPOs. On the other hand they would quickly tend to sell their shares in the secondary market in order to realise returns on their investment in short - run.

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