

# Price performance of newly listed shares on the Johannesburg Stock Exchange

## 1. INTRODUCTION

The Johannesburg Stock Exchange (JSE) plays the single most significant role in capital allocation in South Africa and, with a market capitalisation of US\$275 billion in March 1997, the JSE was the twelfth largest stock-market in the world. Equity capital raised through new listings, rights issues and scrip dividends during 1995 alone was almost R20 billion, indicating that research into the efficiency of the market in pricing new listings is important.

The following objectives for this study were defined:

- to provide up-dated descriptive statistics of new listings on the JSE for the period 1975 to 1995;
- to investigate initial and aftermarket returns to investors in new listings on the JSE over the period 1986 to 1995; and
- to investigate the relationship between certain listing attributes and the returns on new listings.

This research is of relevance to management, market practitioners and investors who have an interest in new listings on the JSE. It also contributes to the debate on market efficiency on the JSE. It is now eight years since the last published in-depth investigation of new listings on the JSE took place and there have been major changes in many of the variables influencing the price performance of new listings. Additionally, this research examines 424 listings; significantly more than the previously highest total of 105 (Barlow and Sparks, 1986).

## 2. LITERATURE REVIEW

New listings have been the subject of significant research effort. However, the transferability of results across studies is poor and no conclusions are universally shared. Furthermore, the findings regarding the effects of influencing factors on share performance have also been contradictory. For example, McDonald and Fisher (1972) found that superior short-term performance of a new issue was of no value in predicting the aftermarket share price. This was supported by Bhana (1989) but not by Bradfield and Hampton (1988), who concluded that securities with high opening premia did generally have relatively higher abnormal returns in their respective after market periods.

Research into initial premia on American markets is well summarized by Ibbotson and Sindelar (1988) who examined 8 668 new issues on SEC registered markets over the period 1960 to 1987 and Ibbotson, Sindelar and Ritter (1994) who examined 10 626 new issues which occurred during the thirty-three year period from 1960 to 1993. They found that:

- Underpricing, (defined as the first-day return) averaged 16,37 % for the 28 years studied.
- Annual averages showed overpricing for only 5 of these 28 years.
- The highest annual average excess return varied from a high of 55,68 % in 1968 to a low of -17,82 % in 1973.
- Some underpricing was severe, with some prices doubling on the day of listing.
- Underpricing varied cyclically, with sustained periods of severe underpricing referred to as "hot" issue market periods.
- The number and volume of IPO's also varied cyclically, and lagged cycles of underpricing by 6 to 12 months.

They concluded "...the persistence of underpricing has shown no signs of abating: the average initial return for the decade of the 1960's was 21,3%; for the 1970's it was 9,0%; for the 1980's it was 15,2% and for the early 1990's it has been 10,9%" (Ibbotson, *et al.*, 1994:67).

With regard to aftermarket performance, they concluded that under-performance of IPO's lasts a full five years after listing and that it was more pronounced among young companies than older, more established firms. They stated that companies going public in hot periods under-perform in the long run, and that performance of shares issued during cold listing periods more accurately represented an efficient market response. They concluded "the empirical evidence on the pricing of IPO's provides a puzzle to those who otherwise believe in efficient capital markets" (Ibbotson, *et al.*, 1994:66) and argued that a periodic whiplash of over-optimism followed by disappointing returns was partially the cause.

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However, they speculated that "IPO's may not be underpriced after all. Instead, the initial aftermarket period may actually be overpriced. The poor long-run performance of IPO's indicates that, in spite of the short-run underpricing phenomenon, the cost of equity

capital is not excessively high for young growth firms." (Ibbotson, *et al*, 1994:74).

Several studies have examined returns on the London Stock Exchange (LSE), and these are summarised in Table 1.

**Table 1: Average initial premia on the LSE**

Research	Sample	Average initial premia
Merrit <i>et al.</i> (1967)	391 (1959 to 1963)	14%
Davis and Grant (1972)	172 (Year not specified)	7,5%
Williams (1972)	268 (1966 to 1970)	11%
Rothman (1973)	187 (1970 to 1972)	9%
Vaughan, Grinyer and Birley (1977)	39 (1966 to 1974)	11%

Table 1 shows that (excluding the crash immediately prior to the great depression of the early 1930s) research into initial premia of new listings on the LSE indicated average positive returns of 7,5% to 14%. The balance of research into aftermarket performance of new listings on the LSE indicated small but positive excess returns.

Aftermarket returns on the LSE were studied by Harris (1933), who found that IPO's of the 1928 new issue boom period substantially under-performed the market during the subsequent three year period. Shares which had been listed with no certified earnings record fell by an average of 86% and other listings fell by an average of 51% compared to the market fall of 34%. However, Scott (1971) found that new issues on the LSE during 1965 out-performed the aftermarket by 1% during their first four years after listing. Williams (1972) found that new issues over the period 1966-1976 gave an excess return of 6% and 0,7% during their first and second years of listing. Davis and Grant (1972) showed that new listings of 1965 to 1970 had a positive return for their first twelve months in five out of six years of the study. Vaughan, Grinyer and Birley (1977) found that new listings of the period 1966 - 1974 showed returns over their first four years which were on average double those of seasoned issues on a non-risk-adjusted basis.

Barlow and Sparks (1986) investigated 105 unseasoned equity issues on the JSE during the period 1972 to 1986. They found a simple weighted mean initial return of 32,1%, with individual maxima and minima of 166,7% and -21,7% respectively. They stratified their sample and used ANOVA to investigate the significance of similarities of the means of sample sub-sets. Significant criteria included the board on which listed, variation in premia over time, rising or falling markets, the existence of hot markets and whether the issue was underwritten or not. Using

regression they found significant correlations of initial returns with the ratio of issue price to net asset value, prospective earnings yields, prospective dividend yields and issue percent subscribed. They also presented evidence that the opening premia on the JSE had been substantially larger than those in the UK, USA, France and Japan.

Bradfield and Hampton (1988) found average opening premia of 48% in hot issue periods (rate of issue thirty-seven per annum) and 25% in cold issue periods from 1975 to 1986. The overall average premium for this period was 27%.

Bhana (1989), using a sample of 80 new listings over the period 1985-1987 found the average initial premia to be 69,7%.

Wood (1986) observed negative average aftermarket returns on the JSE from January 1975 until mid 1986. However, his approach made no adjustment for risk.

Bradfield and Hampton (1988) found that risk adjusted aftermarket excess returns to first-day purchasers who held their position for a year thereafter averaged 29.0 %. Returns were positive for both cold and hot issue periods, with the exception of a short period around the six month mark during which under-performance was noted. A significant positive correlation between opening premia and aftermarket gains existed. These findings conflicted with those of Ritter (1991) and Ibbotson, *et al.* (1994).

Bradfield and Hampton (1988) also investigated the relationships between several factors relating to IPOs and suggested the following:

- issues with higher opening premia had higher aftermarket returns;

- opening premia were found to be positively related to volumes traded in the after market; and
- opening premia were not in any way affected by systematic risk as measured by  $\beta$ .

Bhana (1989) found support for the theory of high opening premia, but showed that risk-adjusted long term performance of IPO's was below average. He concluded that "the market for new issues was based more on speculation and rumours than on investment fundamentals". In this he is consistent with Ritter (1991) and Ibbotson, *et al.* (1994:66).

Barlow and Sparks (1986:85) found a significant difference between the premia offered on shares in differing sectors. They concluded "It is thus shown when taking "sector" as a proxy for risk, that premia and risk are significantly related ..... DCM companies have higher premia than mining companies which in turn have higher premia than industrial companies." No consideration was given to the VCM which was not then in existence.

In summary, initial premia on the JSE have, on balance, been found to be higher than those on the LSE and American markets. On the JSE, annual average initial premia have ranged from 27% to 69,7% (Bradfield and Hampton (1988) and Bhana (1989) respectively). Corresponding figures on the LSE have ranged from 7,5% to 14% and, for American markets, from 10,9% to 21,3%.

Aftermarket excess returns have not been as well researched as have initial returns. On the JSE, Bradfield and Hampton (1988) found that new listings yielded risk-adjusted aftermarket excess returns of 29,0%. By contrast, Ibbotson, *et al.* (1994) found that aftermarket excess returns on American markets were negative for at least the first five years after listing.

Barlow and Sparks (1986) investigated the price setting methodologies for IPOs and found that ninety six percent of practitioners and sixty percent of management used the "two-step" approach in setting prices; firstly, estimating the value of the company, and secondly, setting the issue price at a discount to the estimated share value. Company valuation typically used methods based on either net asset value, dividend stream valuations, present values of future cash flows, economic value added, price : earnings ratios or the Capital Asset Pricing Model (CAPM). The planned discounts to estimated value used for the pricing of new listings were examined for both managers and practitioners. The management sample's planned average was 16,5% versus a practitioner planned sample average of 19,8%. Actual initial premia averaged 32,1%. There are thus two components to underpricing:

- the planned discount; and
- an unplanned return in excess of the planned discount.

The reasons most prominent amongst those identified by Barlow and Sparks (1986) for the discount were the risks of a failed issue and the risk of the share subsequently trading at a price lower than issue price.

### 3. METHODOLOGY

The event study methodology (Bowman (1983), Ball and Brown (1968) and Fama, Fisher, Jensen and Roll (1969)) was used in this analysis. The four steps to the procedure used were:

1. Modelling of the share price reaction using the Capital Asset Pricing Model (CAPM);
2. The excess return  $E_i$  was calculated as that return greater than the expected return predicted by the CAPM;
3. Grouping (averaging) of results was performed using the abnormal performance index (API) of Ball and Brown (1968). This estimates the simple average return obtained from a strategy of investing equal amounts in each security at the time of the event, and holding each investment until its sale at the conclusion of a specified time period. When applied to new listings, the API estimates the return to an investor who receives equal Rand investments in new listings. Each listing is then held for the specified investment time period, irrespective of its performance, at the conclusion of which it is sold:

$$API_t = \left( \sum_{i=1}^N \prod_{j=1}^T (1 + e_{it}) - 1 \right) / N$$

where

- $e_{it}$  = excess return for firm  $i$  in period  $t$ ;
- $T$  = the total time period;
- $N$  = the total amount invested in the portfolio.

4. Analysis of the results was done using statistical tests of significance as described below.

Initial premia, also referred to as initial returns or underpricing of new listings, may be defined as the percentage difference between the closing price on the first day of trade, and the listing price. No listing-event risk estimation methodology has been published and so initial returns could not be adjusted for listing-event risk.

Aftermarket returns are the percentage difference between the closing price at the end of the period of interest and the closing price on the first day of trade. The expected risk adjusted aftermarket returns are, on aggregate, assumed to be accurately predicted using the CAPM. This allows the estimation of excess returns and the use of the event study method.

For the descriptive analysis, 535 new listings of ordinary shares from the start of 1975 to the end of 1995 were identified from JSE monthly bulletins.

Shares listed through a combination of methods, for example, a simultaneous issue of preference shares accompanied by a private placing of ordinary shares and a public offer of ordinary shares were analyzed as three separate, simultaneous issues. Preference share and debenture issues were excluded. The resulting adjusted sample size was 424 issues. Where specific test data were not available, the individual sample sizes used were smaller.

Comprehensive data on new listings prior to 1986 was not available; the most reliable sources of data for that period are the summarized results of previous research (Barlow and Sparks, 1986 and Bradfield and Hampton, 1988). Similarly, company accounting data for share issues prior to 1990 (such as price-earnings ratios, dividend yield histories and forecast earnings) were also not available within the time and cost constraints.

Data sources included the JSE Monthly Bulletin, the JSE Records and Statistics Department, The Financial Mail, the Financial Risk Service for JSE Shares of the University of Cape Town, I-Net, Stock Press and the research publications of Barlow and Sparks (1986) and Bradfield and Hampton (1988).

This research investigated aftermarket returns for a period of up to one year after listing. Those patterns in aftermarket returns which would have only become evident more than one year after listing were therefore not detected. The effects of trading costs were ignored; their impact on these results was minimised by the API methodology used. Dividends were ignored, both from the seasoned listings and the new issues. This has affected the research results to the extent that dividends on newly listed shares differ from those on seasoned issues.

The betas used were calculated by regressing the first 56 weeks of share-price returns for each share against returns on the JSE Overall Index. For the purposes of this research, outlier  $\beta$  values were defined as those exceeding 2.0 or lower than 0.0 and these were adjusted to values of 2.0 or 0.0 respectively in all calculations. The use of weekly data, as opposed to five years of monthly data, whilst unconventional, was appropriate in this instance for numerous reasons

(Bradfield, Barr and Affleck Graves (1988) and Bradfield and Hampton (1988)). Both the mean-adjusted excess returns and risk adjusted excess returns were estimated for comparison purposes.

Bradfield and Hampton (1988) used the following time period notation:

- 0 Close of offer.
- 1 End of first day trading.
- 2 Monday one month after listing.
- 3 Monday one year after listing.

To remain consistent with this system, the following period notation was added:

- 1,25 Close of trading one week after listing.
- 2,5 Close of trading of trading six months after listing.

The following prefixes were added to the notation to reflect the method of risk adjustment:

- NA Non-adjusted returns with no adjustment for risk in each listing.
- MA Mean adjusted excess returns found by subtracting market average returns.
- RA Risk adjusted excess returns found using the API method described above.

For example, the notation RA0x1 is the risk adjusted return measured from the close of the offer to the end of the first day of trading.

Unless otherwise indicated, statistical tests were conducted at the 5% significance level.

#### 4. RESULTS

The distributions of initial returns are shown in Table 2 (annual data) and Figure 1 (monthly data). These results can be compared with those of Ibbotson, *et al.* (1994).

A number of hypotheses were constructed, as detailed below, to examine the various issues discussed above.

##### Hypothesis 1:

Investors in new listings do not receive significant initial returns.

$$H_0 : \mu_s = 0$$

$$H_a : \mu_s \neq 0$$

where

$\mu_s$  is the average initial return.

The highest initial return was 250%, and the lowest was -81,82%. The median return was 15%, and the distribution was seen to be right-skewed. The average initial return was found to be 27,2% with a standard deviation of 44,8% and a t-value for a mean = 0 of 10,6. It was concluded that initial returns were significantly greater than zero and that the phenomenon of under-pricing of new issues exists on the JSE.

The use of risk-adjusted (RA) returns as opposed to mean adjusted (MA) returns has been discussed elsewhere (for example, Bowman (1983)), but, the research results have been inconsistent.

This study found the correlation coefficients between risk adjusted and mean adjusted returns to range between 0.94 for the six-month aftermarket returns to 0.98 for one year aftermarket returns. All correlations were significantly different from zero and it was concluded that a strong linear relationship existed between RA and MA excess returns in all cases.

Ibbotson *et al.* (1994) concluded that positive returns on new listings were followed by long-run under-performance, as the excessive optimism generated on listing waned. Dennis and Kadlec (1994) described market frictions which slowed the process of price adjustment of securities towards their true values. The question was therefore asked whether staggering profits gained on listing may be lost to a delayed efficiency in the aftermarket, and if so, how long this adjustment takes. In other words, was a delayed market efficiency noted, and if so, what was the period required by the market to eliminate the excess return?

Table 2: Annual number of listings, average initial returns and hot vs cold periods

Year	Number of listings	Average initial return	Listings in HOT periods	Listings in COLD periods
1975	4	24%	-	4
1976	0	-	-	-
1977	1	26%	-	1
1978	4	25%	4	-
1979	10	26%	10	-
1980	7	26%	-	7
1981	10	25%	-	10
1982	7	9%	-	7
1983	7	38%	-	7
1984	13	23%	-	13
1985	16	56%	-	16
1986	67	36%	67	-
1987	211	34%	211	-
1988	41	6%	-	41
1989	21	13%	-	21
1990	23	0%	-	23
1991	16	15%	-	16
1992	14	13%	-	14
1993	15	3%	-	15
1994	23	29%	-	23
1995	15	12%	-	15
<b>Total</b>	<b>535</b>	<b>-</b>	<b>292</b>	<b>239</b>
Mean	25.5	27,2%*	73,0	14,9
Median	14	15,0%	39	15

- Notes 1 Averages for the period 1975 to 1985 are from Barlow and Sparks (1986)  
 2 Averages for the period 1986 to 1995 are calculated from I-Net data.

\*( $H_0: \mu_s = 0; n = 308, \sigma = 44,8\%, t = 10,65 \rightarrow \text{Reject } H_0$ )

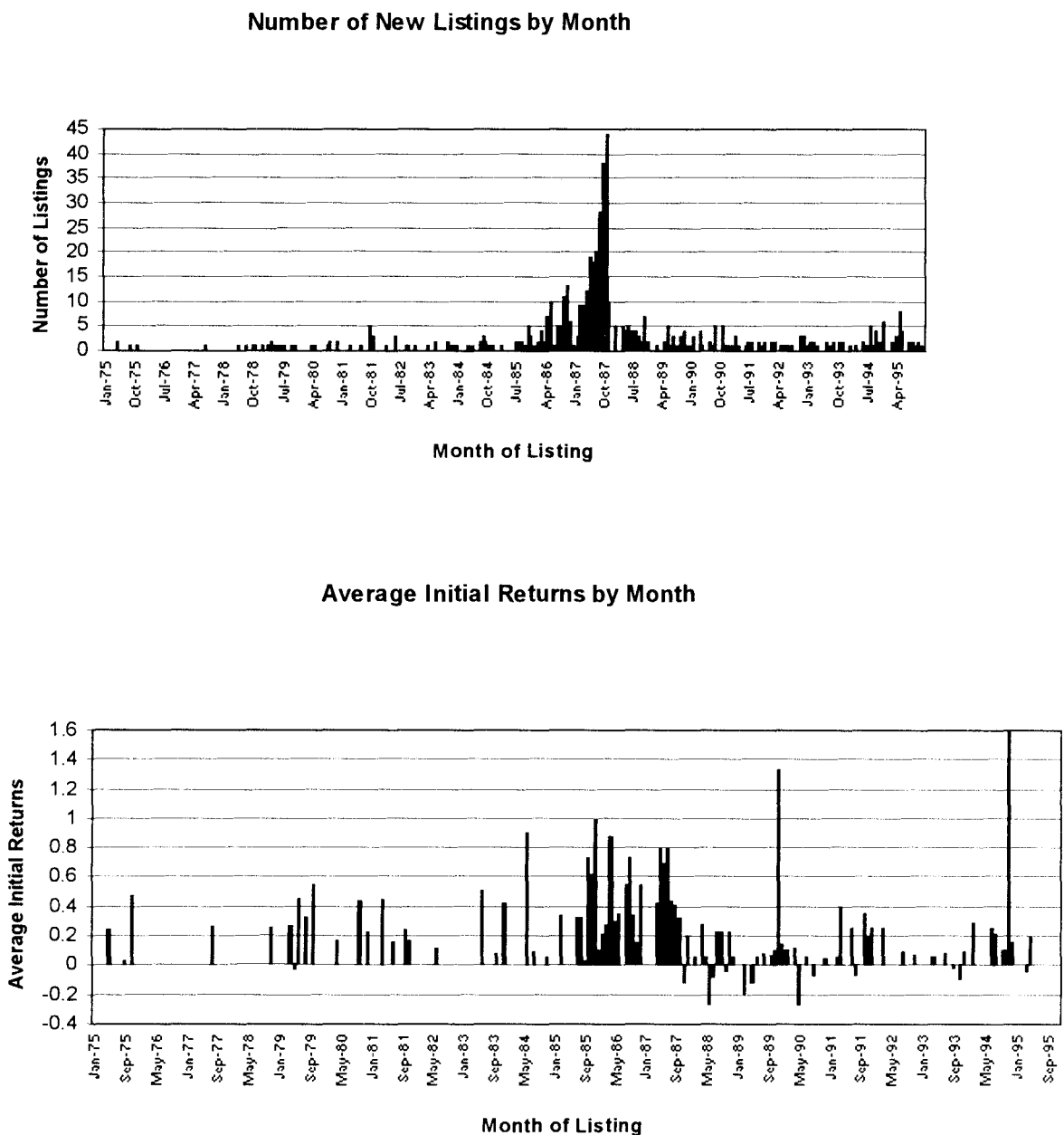


Figure 1: New listings on the JSE – monthly data

**Hypothesis 2:**

Investors in new listings who maintain their share holdings for a period after listing, do not receive significant excess returns.

$$H_0: \mu_{0-1,25} = \mu_{0-2} = \mu_{0-2,5} = \mu_{0-3} = 0$$

$$H_a: \mu_{0-1,25} \neq 0 \text{ or } \mu_{0-2} \neq 0 \text{ or } \mu_{0-2,5} \neq 0 \text{ or } \mu_{0-3} \neq 0$$

The results are shown in Table 3, but in all cases the null hypothesis was rejected and it was concluded that, on average, significant combined returns accrue to investors for at least the period up to one year after listing.

**Table 3: Student's t-tests for mean excess combined returns of zero**

	MA0x1.25	MA0x2	MA0x2.5	MA0x3	RA0x3
Mean	29,32%	41,48%	43,70%	38,36%	36,22%
Sample size	299	347	341	331	308
t-for $\mu = 0$	9,322	5,778	6,449	4,381	3,877
t Prob. level	0,0000	0,0000	0,0000	0,0000	0,0001
Conclusion	Reject $H_0$	Reject $H_0$	Reject $H_0$	Reject $H_0$	Reject $H_0$

Hypothesis 3 investigated only the aftermarket performance:

**Hypothesis 3:**

Investors who purchase shares at the closing price of the first day of listing do not receive significant excess returns.

$$H_0: \mu_{1x1,25} = \mu_{1x2} = \mu_{1x2,5} = \mu_{1x3} = 0$$

$$H_a: \mu_{1x1,25} \neq 0 \text{ or } \mu_{1x2} \neq 0 \text{ or } \mu_{1x2,5} \neq 0 \text{ or } \mu_{1x3} \neq 0$$

In all cases, except the six-month mean adjusted result MA1x2.5, the null hypothesis was accepted. Although all the average excess returns were seen to be slightly positive, in only one case was it statistically significant. This case was partly explained by the slight increase in variance with an accompanying decrease in average return in the period from one month after listing to six months after listing.

It is commonly held in the market that investor interest in a share in the aftermarket is critically influenced by the initial returns to investors. This "loyal clientele" theory holds that companies are rewarded for high initial premia by increased investor faith in management which results in sustained investor interest and loyalty. The result is a higher aftermarket stock price and correspondingly lower future costs of capital (Barlow and Sparks, 1986).

The essence of this issue is therefore: Are newly listed shares which yield a high initial premium rewarded by better price performance in the aftermarket than are those shares which yield a low initial premium? This is examined in hypothesis 4 below:

**Hypothesis 4:**

Aftermarket excess returns on new listings which yield high initial premia are not significantly different from aftermarket excess returns on listings which yield low initial premia.

$$H_0: \mu_A = \mu_B$$

$$H_a: \mu_A \neq \mu_B$$

where

$\mu_A$  = average aftermarket return on stocks yielding high initial premia and  $\mu_B$  = average aftermarket return on stocks yielding low initial premia.

A filter variable was used to group the initial returns NA0x1 according to whether they were greater than or smaller than the median value of 0.15. Unpaired t tests were then conducted on each of the risk adjusted aftermarket return samples (RA1x2, RA1x2.5 and RA1x3). The results are summarized in Table 4.

**Table 4: Student's t-tests of aftermarket excess returns grouped by initial returns.**

	RA1x2 1 month after	RA1x2.5 6 months after	RA1x3 1 year after
Test type	Unequal Variance	Equal Variance	Unequal Variance
Overall average	0,093%	2,72%	3,16%
Average: High initial premia	4,29%	9,71%	19,66%
Average: Low initial premia	-2,97%	-3,21%	-9,52%
t test value	-2,144	-2,562	-2,443
Probability	0,0321	0,0104	0,0155
Conclusion	Reject $H_0$	Reject $H_0$	Reject $H_0$

It was concluded that the mean aftermarket excess returns of new listings offering high initial premia are significantly different to the mean aftermarket returns of new listings offering low initial premia.

The effect on returns of the listing method was examined in hypothesis 5:

**Hypothesis 5:**

The returns on new listings are independent of the method through which that listing occurred.

$$H_0: \mu_1 = \mu_2 = \mu_3 = \mu_4 = \mu_5 = \mu_6$$

$$H_a: \mu_1 \neq \mu_2 \neq \mu_3 \neq \mu_4 \neq \mu_5 \neq \mu_6$$

Six different listing methods were identified and the initial and aftermarket returns were estimated for each category. The results are shown in Table 5.

An un-weighted means ANOVA test on initial returns grouped by listing method showed the null hypothesis to be acceptable and it was concluded that initial returns did not vary significantly by listing method. The same result was found for aftermarket returns.

Hot or cold issue periods are defined as periods during which returns on new listings are significantly higher or lower than average. The occurrence of these periods on the JSE was investigated.

**Hypothesis 6:**

Hot and cold listing periods do not exist on the JSE.

$$H_0: \mu_{hot} = \mu_{cold} = \mu_{total}$$

$$H_a: \mu_{hot} \neq \mu_{cold} \neq \mu_{total}$$

where  $\mu_{hot}$  and  $\mu_{cold}$  are the average excess returns on listings which occurred during hot and cold periods respectively.

Hot and cold periods were identified using the same approach as Bradfield and Hampton (1988). An inspection of figure 1 and the breakdown of returns by listing period shown in Table 2 indicate that hot/cold cycles have taken approximately 10 years to complete. Two complete cycles occurred in the 20 year period from 1975 to 1995, one of which was apparent in the ten-year period from 1986 to 1995.

Average initial returns in hot periods, cold periods and the entire period were 34%, 12% and 27% respectively. The hot issue sample size was 209 issues which occurred over a total period of two years; the cold issue sample size was 99 issues. Initial returns in hot periods were found to be significantly greater than initial returns in cold periods using a t-test (Table 6).

Ibbotson, *et al.* (1994) and Bhana (1989) both showed that whilst significantly higher initial returns could be identified for hot periods, this was not the case with aftermarket returns.

Aftermarket returns by period are summarized in Table 6. The null hypothesis was rejected at the 5% significance level for each period except the one-month RA returns, which could nonetheless be rejected at the 10% significance level.

It was therefore concluded that the aftermarket performance of shares is significantly different for hot or cold periods. Hot period shares continued to outperform cold period shares in the aftermarket. The relationship between initial returns and aftermarket volume traded was examined in hypothesis 7:

**Table 5: Initial returns and aftermarket returns grouped by listing method.**

Listing Method	Initial returns			Aftermarket returns		
	Sample size	Sample mean	Standard dev. $\sigma$	Sample size	Sample mean	Standard dev. $\sigma$
Public Offer	100	23,6%	40,1%	82	-0,53%	57,3%
Public Offer by tender	1	7,7%	-	1	16,7%	-
Private Placing	149	27,7%	42,9%	135	2,7%%	129%
Rights Issue / Dividends	36	42,2%	60,8%	37	-9,0%	62,2%
Take-over	4	0,2%	15,9%	4	-0,0%	26,8%
Pre-listing statement only	12	25,8%	59,9%	12	26,0%	97,0%
Data not provided	6	7,9%	12,4%	6	-3,0%	22,5%
All	308	27,2%	44,8%	313	3,2%	95,7%

**Table 6: Initial returns and aftermarket excess returns for hot and cold periods.**

	Initial returns NA0x1	1 week excess returns RA1x1.25	1 month excess returns RA1x2	6 month excess returns RA1x2.5	1 year excess returns RA1x3
Hot period average	34%	2,26%	2,31%	9,70%	11,70%
Cold period average	12%	-1,15%	-3,09%	-8,06%	-10,77%
Total sample	27%	0,29%	0,09%	2,72%	3,16%
F ratio	17,69	5,12	3,02	12,39	4,11
df; df	1; 306	1; 346	1; 332	1; 321	1; 311
Probability > F	0,0000	0,0237	0,0823	0,0004	0,0426
Conclusion	Reject H <sub>0</sub>	Reject H <sub>0</sub>	Accept H <sub>0</sub>	Reject H <sub>0</sub>	Reject H <sub>0</sub>

**Hypothesis 7:**

There is no correlation between share volumes traded in the aftermarket and initial returns.

$$H_0: \rho = 0;$$

$$H_a: \rho \neq 0$$

The correlation coefficients between the six month and one year aftermarket volumes with initial returns were significant, but low: 0,29 with the six-month adjusted volumes and 0,24 with the one-year adjusted volumes. Therefore, the relationship explained less than 10% of the variation in the six-month and one-year aftermarket trade volumes.

Aftermarket adjusted volumes traded, categorized by initial return are shown in Figure 2. The relationship is clearly seen. Those shares which yielded high initial premia also had high aftermarket trading activity and high standard deviations of returns.

Average returns from listings on the VCM, DCM and Main board were compared in hypothesis 8 using ANOVA, to investigate the results of the different requirements of the JSE for listings on each board.

**Hypothesis 8:**

Returns on new listings are independent of the board on which granted.

$$H_0: \mu_{Main} = \mu_{DCM} = \mu_{VCM}$$

$$H_a: \mu_{Main} \neq \mu_{DCM} \neq \mu_{VCM}$$

Initial premia on listing differed significantly depending on the board on which listed. Average initial premia on the DCM board were highest at 40,1%, followed by the Main board at 23,8% and the VCM board at 7,6%. Aftermarket returns and combined returns on the VCM were seen to be very different from those on the Main and DCM boards.

An investigation of the relationship between returns on new listings and the underwriter responsible for underwriting the listing was performed. Only those underwriters responsible for more than five listings were considered individually; the rest were grouped under the heading "Various".

**Hypothesis 9:**

Returns on new listings are independent of the company responsible for underwriting the issue.

$$H_0: \mu_i = \mu_j$$

$$H_a: \mu_i \neq \mu_j$$

where

$\mu_i$  is the average return on sample group  $i$  and  $i$  and  $j$  are the various underwriters.

Both initial returns and aftermarket returns were seen to be significantly dependent on the underwriter. However, it was seen that the standard deviation of the samples generally varied in size with the returns. Those of greatest interest to investors are possibly those with a low standard deviation and a high average return - see Table 8.

The relationship between returns on new listings and the sponsoring broker was also examined:

**Hypothesis 10:**

Returns on new listings are independent of the company appointed as sponsoring broker.

$$H_0: \mu_i = \mu_j$$

$$H_a: \mu_i \neq \mu_j$$

where

$\mu_i$  is the average return on sample group  $i$  and  $i$  and  $j$  are the sponsoring brokers.

Using ANOVA, initial returns on listing were seen to be independent of the sponsoring broker while one-year aftermarket returns were dependent on the sponsoring broker.

**5. CONCLUSIONS**

Initial returns on new listings from 1986 to 1995 averaged 27,2%; significantly greater than zero. This was 5,1% lower than the 32,1% reported for the period 1973 and 1986 (Barlow and Sparks, 1986) and 0,2% different from the 27,0% over the period of 1975 to 1986 (Bradfield and Hampton, 1988). Underpricing therefore occurs on the JSE.

The standard deviation of initial returns in the research sample was 44,8%, compared to 36,6% found by Barlow and Sparks (1986), and 27,0% found by Bradfield and Hampton (1988). This increase in

volatility of returns over the last ten years was not accompanied by an increase in initial premia and therefore when risk was considered, underpricing was seen to have reduced in magnitude. No conclusion regarding the proportion of underpricing which was a fair return for listing event risk (as opposed to that which was excess return) could be made.

The highest annual average initial return was 56% in 1985; the lowest annual average was 0% in 1995. The highest initial return on one listing was 250% and the lowest was -81,8%.

These initial premia compare with a single average initial return on the NYSE of 21,3% for the 1960's, 90% for the 1970's, 15,2% for the 1980's and 109% for the early 1990's. Available figures for the LSE show returns varying from 7,5% to 14%. Initial premia on the JSE were therefore higher than those in the USA or the UK by between 4,1% and 19,7%. No comparative standard deviation figures for either of these markets were available.

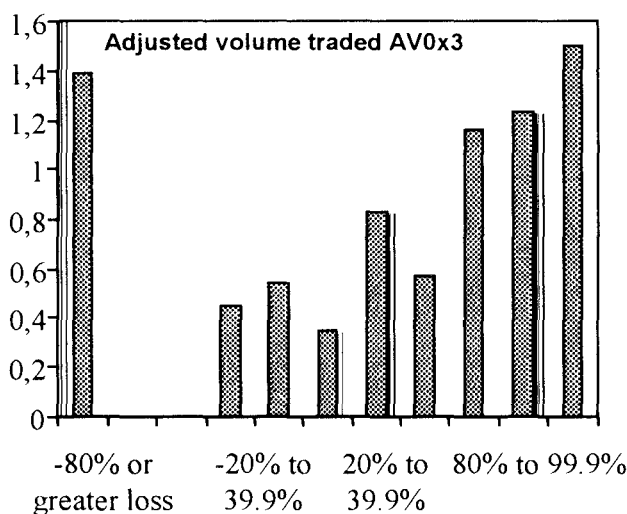


Figure 2: Aftermarket volume-traded vs initial return

Table 7: Returns on new listings on each of the JSE boards

	Initial premia NA0x1			Aftermarket returns RA1x3			Combined returns RA0x3		
	Count	Mean	$\sigma$	Count	Mean	$\sigma$	Count	Mean	$\sigma$
Main	228	23,8%	43,0%	243	4,5%	103%	231	35,7%	176%
DCM	72	40,1%	50,2%	64	2,6%	66,3%	72	42,7%	124%
VCM	8	7,6%	8,0%	6	-45,0%	14,2%	5	-34,8%	14,9%
Overall	308	23,8%	-	313	-12,7%	-	308	14,5%	-

Table 8: Average returns stratified by underwriter, with ANOVA test results.

	Initial premia NA0x1			Aftermarket premia RA1x3		
	Count	Mean	Std dev	Count	Mean	Std dev
Various	49	21,3%	42,6%	62	1,7%	74,6%
Broker only	91	34,8%	51,1%	92	-11,8%	49,1%
BOE	6	46,4%	34,0%	5	1,8%	42,5%
Corbank	8	5,2%	19,9%	7	17,6%	123%
Duros	6	15,6%	47,4%	6	-22,8%	36,3%
Finansbank	6	-6,9%	11,6%	6	-14,9%	31,0%
Firstcorp	7	3,1%	20,0%	7	24,2%	88,3%
FNB	8	18,0%	29,3%	8	-18,0%	19,9%
Investec	6	13,2%	13,3%	6	18,7%	70,6%
Mercantile	6	37,9%	66,3%	5	4,1%	59,7%
Quest4	12	51,1%	57,9%	11	144%	378%
RMB	16	17,3%	28,5%	16	-36,0%	42,8%
Senbank	17	36,3%	31,9%	15	30,8%	92,4%
SMB	34	42,1%	56,4%	35	28,7%	67,3%
UAL	26	9,8%	16,7%	22	-16,8%	37,7%
VMB	10	8,6%	35,4%	10	-20,2%	28,0%
Overall	308	22,5%	44,8%	313	3,16%	95,7%
F-ratio		1,87			2,58	
df		15			15	
df		292			297	
Prob>F		0,0262			0,0012	
Conclusion		Reject H <sub>0</sub>			Reject H <sub>0</sub>	

A comparison between risk-adjusted and mean-adjusted aftermarket returns was made for the period of up to one year after listing. A strong correlation existed between the two, but significant differences in magnitude of the estimated one-year excess returns were found. (The risk-adjusted excess return was 2,87%; the mean-adjusted excess return was 3,16%).

Investors who retained their holdings in new listings purchased at the listing price received significant average excess combined returns of 36,2% over a period of one year, with a standard deviation of 95,7%. The aftermarket excess return component of this return was 3,16%. The major portion of this return was therefore the initial premia on listing.

Positive aftermarket excess returns were found to exist for the entire one-year aftermarket period studied, but these were not all significant. In other words, the average return on new listings during the first year after issue was only slightly higher than that on seasoned issues. The market was therefore reasonably efficient with respect to the pricing of new listings.

Despite reports of numerous under-performing newly listed shares in the years following hot periods, no support was found for the contention that shares which

yielded a high initial premium were more likely to under-perform in the aftermarket (as was found by Ibbotson, *et al.*, (1994) on the NYSE and Bhana (1989) on the JSE). By contrast, the aftermarket returns of new listings with high initial premia were found to be significantly higher than those with lower premia. The average one-year aftermarket returns (RA1x3) on new listings with high initial premia was 19,7% compared to that of -9,52% on new listings with low initial premia. The "loyal clientele" theory was therefore supported: shares which yield a high initial premium on listing create a loyal investing clientele who thereafter contribute to a continued high market price.

No significant differences in initial returns or one-year excess returns were found to result from differences in listing methods. This result is surprising as substantially different motivations may be found for the various different listing methods. However, it is important to note that some listing methods were excluded from the sample as they did not have identifiable issue prices as no offer was made, and the returns in these cases could obviously not be investigated. These listing methods include capital introductions, unbundlings, mergers and other listing methods for which only a pre-listing statement was required.

Hot and cold listing periods were found to exist on the JSE. In the twenty year period considered, two hot cycles occurred at a frequency of approximately ten years. Average initial returns for the hot and cold cycles were 34% and 12% respectively. The aftermarket performance of shares was also significantly affected by the period in which listed. One-year aftermarket returns on cold-period listings averaged -13,6%, compared to 5,6% for hot-period listings. Consequently, the timing of new issues is of significant importance in listing decisions made by management and investment decisions made by the investing public.

The rate at which new listings occur was also found to vary significantly. The highest annual number of listings was 39,4% of the total, in comparison to the annual average of 5% of the twenty-year total. However, a phase difference of approximately six months in listing-premia cycles and listing-volume cycles was also seen to exist.

A significant relationship between share volume issued and initial returns was found to exist. With the exception of two high volume, high return issues which were arguably outliers, the highest average returns (42,9%) were obtained from the 25 to 49,9 million share issue category. This was also the most volatile category, with a standard deviation of 66,9%. No significant relationship between share volumes issued and aftermarket returns was found.

Small but significant correlation coefficients were found to exist between initial returns and six month volume traded ( $r=0,24$ ) and one year volume traded ( $r=0,29$ ). Brokers or analysts seeking active shares are therefore well advised to select those shares which offer the highest initial returns on listing, if they are in an efficient market!

No significant relationship between issue capital raised and returns was found to exist. This is an interesting finding as it suggests no supply and demand effect.

Average initial premia were highest on the DCM board (40,1%), followed by the Main board (23,8%) and the VCM board (8,0%). Once again, the pattern in the returns was correlated with the risk of the investment: higher returns were received in response for higher risks in any given sample. Mean aftermarket and combined returns on the VCM board were significantly different to those on the Main and DCM boards. However, returns on the Main and DCM boards did not differ significantly from one another.

The low returns on the VCM board were somewhat anomalous. They were accompanied by low standard deviations and significant negative returns in the aftermarket. The VCM listings consistently underperformed all other listings and the market as a whole during the aftermarket period.

Both initial returns and aftermarket returns were seen to be significantly dependent on the underwriter of the listing. The greatest initial reward/risk for investors was obtained from the Board of Executors' listings, followed by Senbank and Investec. The lowest initial reward/risk ratio was obtained from Finansbank (which had a low volatility but negative average return), Firstcorp and VMB. The lowest volatility of returns was obtained from Finansbank (consistently negative, with a standard deviation of 11,6%) and Investec, (standard deviation of 13,3% for an average return of 13,2%).

"Broker only" issues were the fourth most volatile of the issues considered, with a standard deviation of 51% and an initial return of 34,8%, behind SMB (56%), Quest4 (58%) and Mercantile (66,3%).

The highest aftermarket returns were obtained from Quest4 with an excess return of 144%, however they were accompanied by a high standard deviation (378%) and were therefore not significantly greater than other returns. In the aftermarket, Senbank (30,8% excess return at a volatility of 92,4%) and SMB (28,7% excess return at a volatility of 67,3%) offered a significantly better reward/risk ratio to investors.

Although average initial returns were seen to vary by sponsoring broker, the differences in the means were not statistically significant. Aftermarket returns were, however, statistically dependent on the sponsoring broker category. This situation highlights the role of brokers in marketing the share in the aftermarket, as opposed to the setting of the listing price. However, only three categories of brokers had significantly different returns.

- Listings for which brokers were not appointed had high standard deviations of returns, and the second highest excess returns. (Excess returns of 67,9% and a volatility of 198%).
- Listings for which multiple brokers were responsible had the second highest standard deviation of returns (excess returns of 9,2% and a volatility of 77%).
- Listings carried out by brokers other than the top nine individually had the third highest standard deviation (70,9%) and the highest average aftermarket returns (119%).

It is therefore apparent that having more than one broker with a vested interest in the immediate aftermarket period may be of assistance in maintaining a high aftermarket share price.

Ibbotson, *et al.* (1994:73) concluded that positive returns on new listings were followed by long-run under performance which "lasts for a full five years". In South Africa, the public press has drawn attention to

what it sees as long run under-performance of new listings, particularly those listed in hot periods: "Once again 1987 listed shares departed in droves; they accounted for almost a third of the de-listings." (Financial Mail, January 21, 1994:64).

This research investigated aftermarket returns for a period of up to one year after listing and no indications of long run under-performance were found. Research into the performance of shares over longer periods after listing will therefore be of significant interest.

## REFERENCES

- Ball R and Brown P. 1968. An empirical evaluation of accounting income numbers. *Journal of Accounting Research*, Autumn:159-126.
- Barlow HR and Sparks RJ. 1986. A study of the pricing of new equity issues listed on the Johannesburg Stock Exchange. *Unpublished research paper submitted in partial fulfillment of the requirements for the MBA degree*. Cape Town: University of Cape Town.
- Bhana N. 1989. New listings share price behaviour on the Johannesburg Stock Exchange. *South African Journal of Business Management*, 20(4):195.
- Bowman RG. 1983. Understanding and conducting event studies. *Journal of Business Finance and Accounting*, 10(4):561-585.
- Bradfield DJ, Barr GDI and Affleck Graves JF. 1988. Asset pricing in small markets - the South African Case. *South African Journal of Business Management*, 19(1):11-21.
- Bradfield DJ and Hampton BG. 1989. The post listing performance of new listings : a study of the JSE. *Suid Afrikaanse Tydskrif vir Bedryfsleiding*, 20(2), June:82-87.
- Davis EW and Grant ATK. 1972. Small business and the capital market. *Moorgate and Wall Street*, 48-63
- Dennis DJ and Kadlec GB. 1994. Corporate events, trading activity, and the estimation of systematic risk: evidence from equity offerings and share repurchases. *The Journal of Finance*, 99(5), December:1787-1811.
- Fama L, Fischer M, Jensen M and Roll R. 1969. The adjustment of stock prices to new information. *International Economic Review*, February:1-21.
- Harris RA. 1933. A re-analysis of the 1928 new issue boom. *The Economists Journal*, 43:453-459.
- Ibbotson RG and Sindelar JL. 1988. Initial public offerings. *The Continental Bank's Journal of Applied Corporate Finance*, 1(2):37-45.
- Ibbotson RG, Sindelar JL and Ritter JR. 1994. The market's problems with the pricing of initial public offerings. *The Continental Bank's Journal of Applied Corporate Finance*, 7(1):66-74.
- Lawson RJ. 1996. Price performance of newly listed shares on the Johannesburg Stock Exchange. *Unpublished research paper submitted in partial fulfillment of the requirements for the MBA degree*. Johannesburg: University of the Witwatersrand.
- McDonald JG and Fisher AK. 1972. New issue stock price behaviour. *The Journal of Finance*, 27:97-102.
- Reilly FK and Hatfield K. 1969. Investor experience with new stock issues. *Financial Analysts Journal*, 25:73-80.
- Ritter JR. 1991. The long run performance of initial public offerings, *Journal of Finance*, 46, March:3-4.
- Rothman J. 1973. *An Analysis of New Issues*. First edition. London: Leopold Joseph.
- Vaughan CD, Grinyer PH and Birley SJ. 1977. *From Private to Public*. First edition. London: Woodhead Faulkner.
- Williams DH. 1972. *An Investigation into New Equity Issues on the London Stock Exchange: 1966 - 1970*. Master of Commerce Dissertation, University of Birmingham.