International Review of Business Research Papers
Vol.3 No.2 June 2007, Pp. 420 - 441

Performance of Initial Public Offerings in Pakistan

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We have studied the short-run and long-run performance of 50 IPOs listed on Karachi Stock Exchange (KSE) from 2000 to 2006. We found that the average under-pricing is 35.66%; and that the average market-adjusted cumulative abnormal return and buy-and-hold abnormal return over the one year after listing are -19.67% & -38.10% by using market adjusted model and are -53.30% & -65.73% by using capital asset pricing model, respectively, which are negative and significant at the 5% and 1% levels respectively. The year-wise and sector-wise analysis of IPOs is also documented. We used also a cross-sectional analysis to explain the level of under-pricing of Pakistani's IPO and found that the level of under-pricing is determined by ex-ante uncertainty, offer size, market capitalization and over-subscription variables while a little power of explaining the under-pricing by percentage of shares offered, price earning ratio, secondary issue and market volatility variables.

Field of Research: Finance

1. Introduction

In the last decades thousands of firms around the world have preferred to go public. An initial public offering (IPO) occurs when a security is sold to the general public for the first time. An IPO can be of any debt or equity security. The issues analyzed are under-pricing, short-run and long-run performance of IPOs in Pakistan. The purpose of this study is to extend the existing literature on the aftermarket performance of IPOs by examining the IPOs on the KSE. In particular, the issues of firms that took place between 2000 and 2006 are analyzed. The focus of the paper is to analyze how KSE behaves in the first trading day, short-run and long-run.

Rest of the paper is organized as follows: Section 2 refers to the existing literature relevant to the initial return, short-run and long-run performance of IPOs and determinants of under-pricing. Section 3 provides the methodology and framework.

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Section 4 documents the results of IPO performance. Section 5 summarizes the findings and concludes the study.

2. Literature Review

The objective of any initial public offering (IPO) is to achieve the highest value for the issuer while ensuring an optimistic start to secondary trading and strong long-term (aftermarket) performance. The problem of under-pricing has been expansively researched and clearly indicates some loss of value to the issuer. However, under-pricing can act as a positive signal and thereby corroborate secondary market trading and aftermarket performance. Rock (1986) provides a more general explanation of under-pricing in where under-pricing arises because of an informational asymmetry between a group of informed investors and a less informed issuing firm. The findings from Rock's model reveal that uninformed investors face a 'winner's curse' since they have a greater chance of being allocated shares in undersubscribed issues than in oversubscribed issues. One implication of Rock's model is that the greater the uncertainty surrounding the post-issue value of IPO shares, the greater the advantage to becoming an informed investor and hence the greater the level of under-pricing required to attract uninformed investors into the market.

Ritter (1991) examines 1,526 IPO stocks and finds a negative 15.08 percent average cumulative matching firm-adjusted return after 36 months. Comparing returns from firms of similar size and industry, the average IPO stock's cumulative abnormal returns are negative 26 percent. Ritter argues that the result is consistent with investors being overoptimistic about potential growth firms. Ritter also argues that the use of equally weighted monthly returns implies an increasing investment in poorly performing firms is avoided using independent monthly rebalancing. Similarly, Spiess and Affleck-Graves (1995) examine 1,246 seasoned equity offerings during the period 1975-1989 in the same way of Ritter (1991), and find a negative abnormal return of 22 percent.

Mcguinness (1992) in his study of 80 Hong Kong IPOs, examines them over the period 1980-90. Examination of the post-listing returns for the IPOs indicates that significant positive returns occur during the first day of trading and disappear thereafter. Analysis of the initial excess market returns on these issues reveal under-pricing of nearly 18 per cent, on average, across the period of interest. He outlines and investigates a number of possible explanations for IPO under-pricing. The results reveal support for three explanations of IPO under-pricing. Jelic, Saadouni, and Briston (2001) studies the share price performance of Malaysian IPOs listed on the KLSE (Kuala Lumpur Stock Exchange) Main Board during the period 1980 – 1995. They report that the month 36, CAR (Cumulated Abnormal Return) is significantly positive at 24.83 percent; buy-and-hold returns (BAHRs) adjusted for the KLSE index are also positive and statistically significant for month 36, at 21.98 percent and is consistent with CAR. They also find that their sample of 182 Malaysian IPO companies between 1980 and 1995 on average seems to insignificantly under-perform their matching companies after three years. The value-weighted mean BHARs for one, two, and three years are all negative but

not statistically significant. This result is consistent with that obtained using the value-weighted CAR measure, which produces a greater fall in returns, indicating that the performance of large IPO companies is inferior to that of small IPO companies.

Omran (2005) studies 53 Egyptian firms from 1994 to 1998 and shows that these firms yield statistically significant initial excess return. He finds mixed results in the aftermarket of those IPOs. In his several cross-sectional regression models, the results indicate that ex-ante uncertainty and over-subscription are the only significant variables in determining the initial excess returns, while over a one year period, the abnormal returns are driven by ex-ante uncertainty and price earning ratio. However, the after market abnormal returns over three and five year periods are significantly affected by the initial excess returns, the price earning ratio, and, to a lesser extent by over-subscription variable. Sullivan & Unite (1999) show first-day returns earned by investors purchasing the initial public offer of a Philippine company are consistent with what has been documented in other countries. They conclude that these returns would be attributed to the under-pricing of IPOs. Initial returns of 22.69 percent are greater than those documented for U.S. IPOs. This finding confirms the view that investors in smaller countries with a less developed capital market are subject to greater risks. However, this under-pricing of Philippine IPOs is dramatically less severe than under-pricing documented for other emerging market countries and less than other Pacific-Rim countries. Possible reasons for these differences include: (1) Stage of market liberalization, (2) Development of the stock market, (3) Stock market regulations, (4) Information disclosure and accuracy, and (5) Specific firm characteristics.

Wai-Yan, Yan-Leung and Ka-Kit (2004) examine the intraday patterns of IPOs in Hong Kong Stock market during the period 1995-1999. They also show that the Hong Kong market is efficient in adjusting for IPOs under-pricing. They conclude that there is no profit opportunity for day-traders who buy and sell shares of newly listed issues during the first trading day. Only those investors who purchase shares directly from IPOs can get profit. Alvarez et al. (2005) in their paper portray two main things: *First*, they analyze the long-run performance of Spanish IPOs made during the 1987–1997 period, and they study the influence of under-pricing as a signaling mechanism in the post-listing performance of IPOs.

3. Methodology and Framework

Empirical evidence shows that there are two main prototypes associated with IPOs: the short-run under-pricing and the long-run underperformance. The study of Loughran et al. (1994) finds that IPO under-pricing phenomenon exists in all the 25 countries investigated, with higher IPO under-pricing in developing markets. Although returns are positive for every country studied, the magnitude of these returns varies greatly. Here, in our paper, we present evidence for a country not previously studied, Pakistan.

3.1 Data Set and Samples

The sample used in the study comprises 50 IPOs of companies floated on the KSE official List from January 2000 through April 2006 and covers 91% of the total number of new issues. The sample included only listings of common stocks; preferred stocks are not examined. The total number of new listed companies during the period 2000-2006 was 55, i.e. total population of IPOs from the period 2000-06 is 55. Data (the particulars of each offering) on Pakistan IPO's were extracted from the web sites www.khistocks.com and www.businessrecorder.com. The web sites provide information for over 55 IPOs filings from 2000-2006. The daily opening, closing, high & low prices of stocks & index were obtained from KSE data base. The data related to company's profit, EPS, Number of share outstanding etc were obtained directly from company's annual reports and company's websites. Information concerning the particulars of each offering was also obtained from the KSE database & Companies' Guide. These sources were helpful in cross checking if there were any discrepancies in the data. For the study of long-run performance, a total of 14 IPOs were excluded from the sample because their data cover a period less than one year. We only included IPOs that have been floated up to April 2005, because we examined the subsequent performance of these IPO stocks over a one-year period. So, for long-term performance the accumulation period in this study is from January 2000 through April 2005.

3.2 Methodology:

3.2.1 Initial Excess Return and After Market Performance:

For the initial after market return (close of the first day of trading) and to determine the extent of IPO under-pricing, for the stocks under review, and to test the hypotheses of IPO under-pricing, we computed the market adjusted abnormal returns ($MAAR_{i,1}$) for each firm using the KSE index as bench mark. We describe the methodology below:

To be consistent with existing empirical evidence, we have employed the methodology used by Aggarwal, Leal and Hernandez (1993) to measure the short-run performance for each IPO and for groups of IPOs. The total return (Raw Return) for stock '*i*' at the end of the first trading day is calculated as: $R_{i,1} = \frac{P_{i,1} - P_{i,0}}{P_{i,0}}$

Where $P_{i,1}$ is the price of stock '*i*' at the close of the first trading day, $P_{i,0}$ is the offer price and $R_{i,1}$ is the total first-day return (raw return) on the stock '*i*'. The return on the market index (bench mark) during the same time period is calculated as: $R_{m,1} = \frac{I_{m,1} - I_{m,0}}{I_{m,0}}$ Where, $I_{m,1}$ is the market index value at the close of first trading and $I_{m,0}$ is the market index value on the offer day of the appropriate stock, while $R_{m,1}$ is the first day's equivalent market return. Using the above two returns (raw return & market

return), the market adjusted abnormal return Model (MAM) for each IPO on the first day of trading is computed as:

$$MAAR_{i,1} = 100 \times \{ [(1 + R_{i,1}) / (1 + R_{m,1})] - 1 \} \quad \text{(a)}$$

The Hypothesis 1, the cross sectional average initial excess return is different from zero is tested.

3.2.2 Short-run Performance of IPOs

The short-run performance of IPOs in KSE is measured by computing the level of this average market adjusted returns measure, in daily returns form, over the first 15 trading days. *Hypothesis 2, the cross sectional average MAAR on short term is equal to zero is tested.*

3.2.3 Long-run Performance of IPOs

In contrast to initial excess return and short-run performance of IPOs, the long-run performance seems to be more complicated and there is no consensus on the appropriate way of calculating the long-run abnormal returns. However, first CARs (Cumulative abnormal returns) & BHARs (Buy-and-hold abnormal returns) using MAM (Market Adjusted Model) is computed and then CARs & BHARs using CAPMAR (Abnormal return using CAPM Model) are computed.

3.2.3.1 CARs & BHARs using MAM

The market-adjusted long-run returns are calculated for a period of 12 months following the first trading day. Allowing for the severe initial under-pricing and the time these prices take to adjust downwards to the market equilibrium in the first day of trading sessions, the first day of trading is excluded from the study of long-run returns. Following a methodology that is comparable with Ritter (1991), we have calculated the long-run returns using the market-adjusted model i.e. $MAAR_{i,1}$ in equation (a). The market-adjusted return for stock "i" in the tth month is defined as: $ar_{it} = r_{it} - r_{mt}$

Where r_{it} is the return for firm "*i*" in the t[th] trading month and r_{mt} is the return on the benchmark (market return) during the corresponding time period. The average market-adjusted return on a sample of *n* stocks for the t[th] month is the equally-weighted arithmetic average of the market-adjusted returns: $\overline{AR_t} = \frac{1}{n} \sum_{i=1}^{n} ar_{i,t}$

The cumulative market-adjusted long-run performance (CARs) from event month *q* to event month *s* is the summation of the average monthly market-adjusted returns is:

$$CAR_{q,s} = \sum_{t=q}^{s} AR_t \quad (1)$$

The second measure we use is the one-year buy-and-hold market-adjusted returns (BHARs), defined as:

$$BHAR_{i,T} = \left[\prod_{t=1}^{\min\{T,delisting\}} (1+r_{i,t}) - 1 \right] - \left[\prod_{t=1}^{\min\{T,delisting\}} (1+r_{m,t}) - 1 \right] \quad (2)$$

$BHAR_{i,T}$ is the buy-and-hold abnormal return for security i in period T. Where, T is after market trading month 12 and Min{T, delisting} is the earliest last day before listing. In KSE no delisting took place of the sample selected for study. The mean market-adjusted buy-and-hold long-run return for a period *t* is defined as: $BHAR_t$

$$= \frac{1}{n} \sum_{t=1}^{n} BHAR_{i,T}$$

3.2.3.2 CARs & BHARs using CAPMAR

As, the returns using the MAM are not adjusted for risk other than that prevailing in the market as a whole, the Sharpe-Lintner Capital Asset Pricing Model (CAPM) is also used in the study to calculate the abnormal return to take into consideration the risk of individual IPOs.

$$CAPMAR_{i,t} = [\, R_{i,t} - R_{f,t} \,] - \beta_i [\, I_{m,t} - R_{f,t} \,] \qquad \text{(b)}$$

Where $CAPMAR_{i,t}$ is the abnormal return using CAPM for stock *i* in month *t*, $R_{f,t}$ is the risk free rate, used as proxy of a short-term one month rate for bank deposits. β_i is the risk of stock *i*. and is calculated from CAPM regression model, which is the slope obtained from regressing of:

$$[\, R_{i,t} - R_{f,t} \,] \text{ on } [\, I_{m,t} - R_{f,t} \,]$$

for the estimation period with the regression line going through the origin.

CARs and BAHRs as mentioned in equation (1) equation (2) are then computed by using the CAPMAR. Model (a) and (b) are then employed to calculate one year after market returns based on weekly and by-weekly analysis. The statistical significance of cumulative abnormal returns is tested by t-statistics. The *Hypotheses 3 & 4, The cross sectional CARs & BAHRs after one year are different from 0 are tested.*

3.2.4 Cross-sectional Regression Analysis

To better understand the magnitude of level of under-pricing i.e. observed initial and aftermarket performance of IPOs, cross-sectional regressions are conducted to identify the significance of several variables. The market adjusted abnormal returns (MAAR) is used as dependent variable. The major explanation of under-pricing using variable MAAR was outlined by focusing on the variables Ex-Ante (ex-ante uncertainty), Mkt-Cap (market capitalization), PSO (proportion of shares offered), MV (market volatility), SI (secondary issue), PE (price earning ratio), Over-Sub (over subscription) and Size (offer size). Descriptions of these variables are given in Table 1, in Appendix.

Hypothesis 5:
According to asymmetric information theories, the uncertainty about the value of recently established firms such as new issues (IPOs) is higher than that about well-known firms. As a result, investors are worried about the future performance of IPOs, which is referred to as ex-ante uncertainty. Therefore there should be a positive relationship between the levels of under-pricing, MAAR and ex-ante uncertainty, Ex-

Ante. Beaty & Ritter (1986) indicate a positive relationship between level of under-pricing ex-ante uncertainty. We hypothesize: *There is a positive relationship between MAAR and Ex-Ante.*

Hypothesis 6:
In our study, one major explanation of under-pricing is also scrutinized, analyses the possible signaling role of under-pricing. In this connection, the market capitalization of the issuing firm at close of the tenth day of trading post flotation, Mkt-Cap is defined. This measure should capture, or give an indication of, the issuing firm's intrinsic value. If the signaling argument holds, Mkt-Cap should then be positively related to IPO under-pricing levels. The hypothesis is: *There is a positive relationship between MAAR and Mkt-Cap.*

Hypothesis 7:
Welch (1989) notes that IPO under-pricing may serve to increase funds raised from subsequent seasoned issues. Consequently IPO under-pricing may also be positively correlated with the incidence of such secondary issues. Variable SI is used to capture this effect. Similarly, Allen and Faulhaber (1989) argue that firms some times offer IPOs priced below their intrinsic value to signal their quality to investors, thus expecting to have a better chance at offering subsequent seasoned issues at high prices. Therefore we expect a positive relationship between level of under-pricing and secondary issues. The hypothesis is: *There is a positive relationship between MAAR and SI.*

Hypothesis 8:
Another explanation, of under-pricing is linked with oversubscription. In this context, Rock (1986), in his model, argues that for over-priced shares, only uninformed investors submit purchase order and get 100% allocation of shares. However for under-priced stocks, when un-informed and informed investors, both, submit the purchase order, the allocation of stocks is rationed between them. Therefore a measure of times the share offering was over-subscribed then it stipulates a positive relation between level of under-pricing and oversubscription. This provides the hypothesis: *There is a positive relationship between MAAR and Over-Sub.*

Hypothesis 9:
Larger firms, as compared to smaller firms, present less uncertainty for potential investors. Larger organizations, for example, have greater access to resources essential for firm survival and profitability (Finkle, 1998). Consistent with this, several studies have found a negative association between firm size and under-pricing (e.g., Carter, Dark, & Singh, 1998). Another factor suggestive of a correlation between firm size and IPO firm performance is that larger firms tend to attract more prestigious underwriters (Carter, Dark, & Singh, 1998). Smaller firms may be perceived as offering lower performance potential, leading prestigious underwriters to avoid these issues so that they do not directly bear any loss through undersubscribed issues. Underwriters will also be concerned about passing on a riskier issue to their clients, thereby endangering future business. Consistent with larger firms reducing the level of uncertainty in the IPO process hypothesis is: *There is a negative relationship between MAAR and Size.*

Hypothesis 10:
The gross proceeds of an IPO are routinely included as a variable in IPO research. Gross proceeds are a function of the total number of shares offered with the IPO and the offering price of those shares. Larger IPOs, in terms of the number of shares and the offering price, would normally be offered by more established firms, which should reduce the perceived risk of the offering. Beatty and Ritter (1986) describe this phenomenon as an "empirical regularity" that smaller offerings are, on average, more speculative (i.e., greater uncertainty) than their larger counterparts. Therefore a negative relation between the proportion of shares offered and level of under-pricing is expected. The hypothesis follows: *There is a negative relationship between MAAR and PSO.*

Hypothesis 11:
The degree of under-pricing may also depend on market volatility. The regulatory authorities try to minimize the probability of unsuccessful issues by lowering prices as long as market volatility is high. In prior studies, Reilly (1977) indicated that IPO issues following a rising market experience higher under-pricing levels than IPOs following a falling market Therefore, a positive relationship between market volatility and the level of under-pricing is expected. The hypothesis deals with this relationship Is *there a positive relationship between MAAR and MV.*

Hypothesis 12:
To measure the firm's quality the variable price earning ratio is used. The proxy we use here is the price earning ratio, PE, which ultimately shows the profitability of the company. The PE variable measures the average price earnings ratio for the last two or three years before the firm's listing (for some IPOs data of the third year of PE ratio was not available, we have used last two years data), since this is the information that investors have upon IPOs and is one of the two factors that determine offering prices during the sample period. We expect a positive coefficient for the PE variable. The hypothesis is: *There is a positive relationship between MAAR and PE.*

The empirical model is estimated using Ordinary Least Squares (OLS) regression technique and is displayed as follows:

$$\text{MAAR}_i = \alpha + \beta_1 \text{ Ex-Ante}_i + \beta_2 \text{ Mkt-Cap i} + \beta_3 \text{ PSO}_i + \beta_4 \text{ MV}_i + \beta_5 \text{ SI}_i + \beta_6 \text{ PE}_i + \beta_7 \text{ Over-Sub}_i + \beta_8 \text{ Size}_i + \varepsilon_i$$

4. Data Analysis & Discussion

In this part of the analysis, the descriptive and quantitative study is made as follows: First, we provide an analysis of the initial return, year-wise as well as sector wise. The analysis in regard to day traders is also made. Second, we measure short-term performance of IPOs to see whether under-pricing is eliminated in early trading or not. Third, we measure the long-run performance using different models. At the end, we use regression analysis to capture the effect of explanatory variables.

4.1 Descriptive Statistics

In Table 2 displayed in Appendix, Panel A shows that the average number of shares offered, remains at around 29.60m. Panel B shows that the average offer price is at Rs.17.84. The offer price ranges from Rs.10.00 to Rs.80.00. Panel C, shows that the average capital raised is at Rs.453.68m. The capital raised ranges from Rs.40.00m to Rs.6881.48m. During 2004, highest average capital raised, amounting to Rs.1239.96 m. Panel D shows that the average subscription rate is 1.85 times. The average subscription rate ranges from 0.01 times in 2001 to 18.67 times in 2005. In every year, most of the IPOs are over-subscribed with a subscription rate greater than one, except in year 2002, where, subscription rate is 0.81 times. Panel E, presents information about index of KSE, which is used as bench mark. The KSE ranges from 1,070 points to 12,137 points during the sample period. Panel F presents some measures of central tendency and variability of variables used in regression & correlation analysis during the sample period. Panel G presents measures of central tendency and variability one year after market Performance of IPOs during the sample period.

4.2 Initial Excess Return and After Market Performance

Form the study it is found that on average the investors outperform (i.e. there is under-pricing of IPOs in the market), through buying stocks at subscription prices in the primary market and selling them on first trading day in stock market. The results reveal that 30% (15 out of 50 IPOs) provide investors with initial negative excess abnormal return, presenting that these IPOs are overpriced Whilst 70% (35 out of 50 IPOs) provide investors with positive initial excess abnormal return, presenting that these IPOs are under-priced. However, jointly, all 50 IPOs provide investors with positive initial excess abnormal return, and confirm the under-pricing phenomenon of IPOs in Pakistan as compared with other countries. For the entire sample, the Market Adjusted Abnormal Return (MAAR1) is 35.66% with an associated *t*-statistic of 4.09, which is significantly different from zero at the 1% level. Which disprove our null hypothesis 1. The MAAR1 ranges between a Maximum return of 345.86%, and Minimum return of (17.19%) with standard deviation of 61.59. Based on our information, we may say with a confidence level about 99% that if investors subscribed for shares in the new issues at offer price, they would make an average profit of 35.66%.

Initial Raw Returns, Market Returns & Market Adjusted Abnormal Returns are also calculated on opening, closing, highest & lowest share prices & market index. We observe that investors can make an average profit at least 23.98% if they sell the stocks at any time during the first trading day. Similarly investors could make an average profit of 44.68%, if they sold the stocks at the time when share prices were at highest; this applies only to investors who have subscribed for new issues. The investors can make an average profit of 31.91% if they sell the stocks in the opening session of stock market. Similarly they can make an average profit of 35.66%, if they sell the stocks at the close of first trading day. The results further reveal that there is no profit for day traders. Investors can not make any profit when they buy and sell the new issues on the

first trading day. This implies that investors could only make profit if they purchased new issues in IPOs at the offer price but not after the stocks had been listed. These finding, regarding day traders selling and buying of IPOS are consistent and in accordance with the findings of Wai-Yan Cheng; Yan-Leung Cheung; Ka-Kit Po (2004). So, the benefits of under-pricing accrue almost entirely to investors who buy shares in the IPOs and sell them at the close on the first trading days.

4.3 Year-wise analysis of IPOs

The initial mean first day return of public offerings of KSE based on yearly basis, specifically, for every year of period 2000-2006 the initial first day return i.e. the Initial Raw Returns, Market Returns and Market Adjusted Abnormal returns are computed. From data, it is obvious that the mean first day return of IPOs is positive for every year of the examined period 2000-2006. The rate of return fluctuated between 0.19% and 63.75% and the total mean rate of return of the first day trading during the whole period, is 35.66%. In detail; in 2000 the estimated mean first day return of IPOs was 27.33%, and became 0.19% in 2001. The rate increase to 9.57% in 2002, and then jumped to 41.40% and 41.75% during the following 2 years subsequently. In 2005 it declined to 37.61% then rose again in 2006 to a record high of 63.75%. During that year, the Capital Market realized an enormous growth and the KSE Index reached its highest historical level. The performance of KSE index was one of the highest worldwide, as in year 2006, the Index's value crossed 12,000 points.

Also, it is noted that till April-2006 the Index's highest value was 12,137 points (on April 14, 2006) whilst its lowest value was 9,672 points in that year. So, the KSE index has shown considerable volatility during till April-2006 and reached its highest level at 637.50% compared to year 2000. Moreover, high returns have also been recorded in the market of IPOs during the three years before 2006. In these three years, the mean initial return was higher than 40%, and the market adjusted abnormal returns were more than 37%, these returns are higher than the average market adjusted abnormal return of whole the sample. On the other hand year 2001 indicates average lowest abnormal return of 0.19%. In that year, the lowest KSE index was 1,075 points and highest market index was 1550 points with SD of 96.32%. One more informational clue of year-wise IPO's initial returns is that, out of 3 IPOs, 1 IPO was overpriced that was giving negative returns at the end of the first day of trading in the stock market. In detail; in year 2002, 2 out of 4 new issues, in year 2003, 1 out of 6 new issues, in year 2004, 3 out of 15 new issues, in year 2005, 7 out of 19 new issues and in year 2006, 1 out of 2 have shown negative first day return.

4.4 Sector-wise analysis of IPOs:

The results indicate some sector-wise analysis of KSE. Specifically, regarding FINANCIAL FIRMS, the MAARs are found to be positive for every sector except Mudarba Sector. Similarly, regarding NON-FINANCIAL FIRMS, the MAARs are also positive for every sector except Refinery & Textile Composite Sectors. The average market adjusted abnormal rate of returns of all sectors fluctuated between -12.28% and

156.16%. The market of new issues listed, specifically the sector Oil & Gas has reached its highest level of returns. The IPOs of this sector comes in year 2005 and during that period, oil prices rise up historically. This sector, also perform very well due to oil crises in the world, today (April 20, 2006) oil prices at its peak of $75 per barrel, historically highest, and ultimately credit goes to this sector reflecting a superfluous profit for this sector.

Furthermore, high initial raw returns have been observed in sectors Commercial Banks, Power Generation & Distribution, Oil & Gas Exploration, Chemical, Transport and Miscellaneous. In these sectors, the mean initial raw returns is higher than 43% while the average market adjusted abnormal returns is more than 50%, that is higher than the average market adjusted abnormal return of whole the sample of 50 IPOs (35.66%). On the other hand the remaining sectors indicate lower average market adjusted abnormal returns than the average market adjusted abnormal return of whole the sample.

4.5 Short-run Performance of IPOs:

The short-run performance of IPOs in KSE is also analyzed. It reports the level of this average market adjusted returns measure, in daily returns form, over the first 15 days of trading in Pakistani stocks (using all 50 IPOs over the period 2000-2006). This analysis is helpful in determining the extent to which Pakistani IPOs are under-priced and also the period over which any, or most, of the under-pricing is eliminated. Prior studies have typically shown that market adjusted returns from under-pricing are eliminated in early trading. Theses results are in accordance with the former studies of Dawson (1987) and Mcguinness (1992) and other studies in this regard. The average market adjusted returns, for IPOs scrutinized, have been found significantly different from zero (at the 5 per cent level of significance) for the first day of trading. Therefore null hypothesis 02 is rejected.

4.6 Long-run Performance of IPOs

4.6.1 CARs & BHARs using MAM.

These results give the average monthly returns with the associated *t*-statistics for 12 months after going public. The sample size was reduced to 36 IPOs covering the period of one year after listing. The average market-adjusted cumulative return over one year after listing for the entire sample is found to be -19.67% with a *t*-statistic of -1.8169, which is significantly negatively different from zero at the 5% level of significance. As with most IPO's long-run performance, the one-year CARs, in the Pakistani IPO markets are significantly negative at the 5% level, which means that investors achieve abnormal negative returns and their IPOs investments under-perform the market over a period of one year. Therefore, these results indicate that the null hypothesis (that the mean abnormal returns over a period of one year are not different from zero) may be rejected at 5% level. The *t*-statistic is also negative, implying that IPOs under-perform the market in long-run. It means that long-run performance of IPOs listed on KSE is disappointing for investors. Among monthly average market-adjusted returns, only 3 out

of 12 IPOs are found to be positive with *t*-statistics higher than 0.52, while 9 IPOs out of 12 have negative returns.

The excess returns vary between -5.94% and 4.72% over the study period. The returns reach at peak, 4.74% in the 3rd month of trading. A minimum return of -5.94% is recorded in the 9th month after listing. Apart from returns for the 3rd, 6th and 10th trading months, returns for all remaining trading months are all negative.

Some Yearly, Sector-Wise, analysis of Raw, Market Return, and Market Adjusted Abnormal Returns after one year of public offerings of the KSE is also analyzed. Results indicate, it is obvious that the average MAARs of IPOs after one year are negative for all sectors regarding FINANCIAL FIRMS except Investment Banks Sector. Similarly, the average MAARs of IPOs after one year are also negative for all sectors regarding NON-FINANCIAL FIRMS except Refinery, Oil & Gas Marketing, Oil & Gas Exploration and Cement Sectors for the examined period 2000-2006.

The average by-weekly market-adjusted cumulative return over the period of one year after listing is -21.61%, which is significantly negatively different from zero at the 5% level wit *t*-statistic -2.35572. Similarly, the average weekly market-adjusted cumulative return over the period of one year after listing is -21.57%, which is negative and significantly different from zero at the 5% level with *t*-statistic -2.47119.

The average market adjusted BHARs for the sample period as a whole, for the period of one year is found negative, the average monthly market-adjusted BHAR over the period of one year after listing is -38.10%, with *t*-statistic -4.62234, similarly the average by-weekly market-adjusted BHAR is -37.53% with *t*-statistic -4.41974, and the average weekly market-adjusted BHAR is -37.32% with *t*-statistic -4.28820; all these returns are negative and highly significant at the 1% level. Like CAR model, the BHAR model also indicates that some IPOs outperform, but as a whole, these IPOs under-perform over a period of one year holding. The results calculated by BHAR model are very consistent as compared with CAR Model. That is why more studies prefer the BHAR model for calculating the long-run performance of IPOs.

4.6.2 CARs & BHARs using CAPMAR

Because the returns over a period of one year, in CARs using the market adjusted model, are not adjusted for risk factor the above model (the Sharpe-Lintner's) capital asset pricing model (CAPM) is used to calculate the long-run returns to take into account the risk factor for each individual IPO. The average market adjusted CARs using CAPM model for the sample period as a whole, over the period of one year was found to be negative. The under-performance of these IPOs is statistically significant. The CARs model, using CAPM approach also indicates that some IPOs outperform in the market, but as a whole, these IPOs under-perform over a period of one year after the listing. The results reveal that the average monthly market-adjusted CARs using CAPM model over the period of one year after listing is -53.30%, with *t*-statistic -5.29502. Similarly, the average By-Weekly market-adjusted CARs is -57.67% with *t*-

statistic -6.36599 and the average weekly market-adjusted CARs is -67.57% with *t*-statistic -4.81088, all these returns are negative and highly significant at the 1% level. The results calculated by CARs using the CAPM model are very consistent as compared with CARs using MAM.

The results indicate that the average monthly market-adjusted BHARs using CAPM model over the period of one year after listing is -65.73%, with t-statistics -9.93305, similarly the average By-Weekly market-adjusted BHARs is -68.59% with t-statistics -9.93350 and the average weekly market-adjusted BHARs is -66.19% with t-statistics -6.06465, all these returns are highly significantly negatively different from zero at the 1% level. The average market adjusted BHARs using CAPM model for the sample period as a whole, over the period of one year is also found negative. The under-performance of these IPOs is statistically significant

4.7 Results of Cross-Sectional Regression Analysis

We have used the ordinary least square regressions to explain the cross-sectional variation in the abnormal returns. Table below, provides the result of our regression model. The results obtained by running regression analysis on Excel, e-views and SPSS Software, are similar to each other.

Table: Multivariate Cross-Sectional Regression Analysis

Total panel observations		50
R-squared		0.753807
Adjusted R-squared		0.705769
F-statistic		15.69199*
Prob (F-statistic)		0.00
Variables	Coefficient	*t*-statistics
Intercept	-0.499716	-1.372867
PSO	0.483845	1.133844
Over-Sub	0.031946***	1.643022
Ln (Size)	-0.431565*	-2.809688
PE	0.001298	0.509833
Ln (Mkt-Cap)	0.368446*	2.929904
MV	0.0000194	0.090165
Ex-Ante	3.022112*	5.85427
SI	-0.191245	-0.495546

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

The determinants of initial excess returns or the level of under-pricing are examined here. The regression model's results, show that there is a positive and highly significant (at the 1% level) relationship between Ex-ante uncertainty and the level of under-pricing. These results confirm the earlier significant bivariate results noted between these two variables. This result is in agreement with the asymmetric information theories; the uncertainty about the value of recently established firms such as new

issues (IPOs) is higher than that about well-known firms. This finding supports Beatty and Ritter (I986) argument that investors seek higher returns to compensate for their anxiety about future performance of IPOs. Therefore our null hypothesis 05 can be rejected. Table also shows that there is a positive and highly significant relationship (at the 1% level) between Market capitalization and the level of under-pricing. This result is contrary to MacGuinness (1992), in which Market capitalization variable was found insignificantly related to the level of under-pricing measure. However, this suggests strong support for the signaling view of under-pricing advanced in Allen and Faulhaber (1989) and Welch (1989), where firms with higher intrinsic values signal their firms' values through increased under-pricing. Therefore, there is a positive relationship between the level of under-pricing and Market capitalization variables. Therefore, our null hypothesis 06 can also be rejected.

In Table the results of variable SI show that, there is an insignificant relationship between SI & the level of under-pricing variables. These results are contrary to Welch (1989), Allen and Faulhaber (1989) and MacGuinness (1992) in which variable SI remained significant and indicated support for the view that firms making secondary offerings, in the twelve months subsequent to an IPO, under-price initial offerings significantly more than those firms who do not make such secondary offerings. The reason for this contrary result may be that in our sample only one IPO makes a secondary issue. Therefore, our null hypothesis 07 can be accepted. Table also shows that there is a positive and significant effect of oversubscription on the level of under-pricing, (at the 10% level). This is consistent with both the absorption capacity of the market and the winners curse model discussed in Rock's (1986). So, our null hypothesis 08 can be rejected.

The results of the regression model also show that there is a negative and highly significant relationship between Offer size variable and the level of under-pricing (at the 1% level). These results confirm the earlier significant bivariate results noted between these two variables as described by Finkle (1998) and Carter, Dark, & Singh, (1998). Several other studies found a negative association between firm size and under-pricing. Therefore, the null hypothesis 09 can also be rejected. The IPOs performance was described by Carter, Dark, & Singh, (1998) & Jain & Kini, (2000) and Beatty & Ritter (1986) as an "empirical regularity" that smaller offerings were, on average, more speculative (i.e., greater uncertainty) than their larger counterparts. They found a negative relationship between the proportion of shares offered and the level of under-pricing. Contrary to this, no relationship was found between PSO & level of under-pricing as shown in above Table. Our results support Omran (2005) who found a little value of explaining the under-pricing by PSO variable. Therefore, the null hypothesis 010 can be accepted.

This positive relationship is also found between the degree of under-pricing and market volatility variables. Although this result supports the prior studies, Reilly (1977) and Paul MacGuinness (1992). But our result is not significant. However, our results are still in agreement with Omran (2005) that there is little value of explaining the under-pricing by market volatility variable with negative sign. Therefore, null hypothesis 011 regarding no relationship between market volatility and the level of under-pricing can be accepted. To

measure the firm's quality and characteristics, the variable price earning ratio is used. The results are statistically insignificant. The result of this variable indicates a little power of explaining the level of under-pricing. Therefore, we can not reject the null hypothesis 012. The overall model is highly significant with F-statistic 15.69. The adjusted R^2 at 70.58 implies that model explains a large portion of the variability of under-pricing of IPOs in KSE.

5. Conclusion

This study has examined the short and long runs share price performance of Pakistani's IPOs during the period 2000 to April-2006. The results are similar to those found in developed markets and are dependent upon the methods used. The under-pricing is also observed in Pakistani's IPOs. The results show that the IPOs give economically and statistically significant initial excess returns in line with the under-pricing happening of IPOs, which is widely documented in the literature. Our findings reveal that there is no profit opportunity for day-traders who buy and sell shares of newly listed issues during the first trading day; however, it is found that, there is definite profit opportunity for those investors, who are willing to bear price uncertainty in the primary market. These investors according to our sample study may earn an average profit of about 35.66%.

In cross-sectional regression models, the results indicate that ex-ante uncertainty, offer size, market capitalization and over-subscription are the only significant variables in determining the level of under-pricing (initial excess returns). A little value of explaining the under-pricing by percentage of shares offered, price earning ratio, secondary issue and market volatility variables, is observed.

This study finds significant under-performance when cumulative abnormal returns (CARs) and buy and hold abnormal returns (BHARs) are calculated using both market adjusted model (MAM) & capital asset pricing model (CAPM). Our results suggest that investors, who measure their investment in IPO companies, will have negative returns over the period of one year after listing. Then they will achieve abnormal negative returns and their IPOs investments under-perform the market over a period of one year. It means that long-run performance of IPOs listed on KSE is disappointing for investors.

The year-wise analysis reveals that the mean first day return of IPOs remains positive for every year of the examined period 2000-2006. The rate of return fluctuated between 0.19% and 63.75%. Similarly, sector-wise analysis indicates that the mean first day returns of IPOs are positive for the all sectors except Mudarabas, Refinery and Textile Composite sectors for the examined period 2000-2006. The average market adjusted abnormal rate of returns of all sectors fluctuated between -12.28% and 156.16%. The sector Oil & Gas Marketing indicates its highest level of first day returns. We conclude that there are positive abnormal returns of IPOs in short-run and a negative abnormal performance after one year. It might be that investors are overoptimistic at the date of offerings and short-run trading, which causes short-run stock prices to rise above their

symmetry level. Later, when they correct their misevaluations over time, negative abnormal long-run returns are the outcome.

There is an enormous array of research problems which have yet to be addressed in the study of IPOs in Pakistan. No research has yet addressed Pakistani IPOs prior to this study. The same study might cover the period before the year 2000, as this study has covered only the latest period 2000-20006.

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Appendix:

Table 1: Description of variables, explaining the under-pricing of KSE IPOs.

Variable	Description
MAAR	Market adjusted abnormal returns (level of under-pricing), measure over the period between the offer price in the issue and the close of trading on the day 1.
Ex-Ante	Measure of the ex-ante uncertainty is calculated as the SD of daily returns in the newly listed stocks over a period of one month from the date of listing
Ln (Mkt-Cap)	Measure of the firm's intrinsic value; it is the market capitalization of the issuing firm and is obtained at the close of the 10^{th} day of trading in the newly stocks.
SI	Incidence of secondary market issues; it is the dummy variable coded 1 if a secondary issue of common stock is made within 12 months, other wise zero.
MV	Measure of market volatility as the standard deviation of daily market return (KSE Index) over the two months before the closing date of subscription.
Ln (Size)	Size is the offer size variable. It is the net measured as number of offering shares multiplied by the offering price
PSO	PSO is the proportion of shares offered to general public.
Over-Sub	Over-Sub is the oversubscription. A measure of times the share offering – over subscribed.
PE	PE is price earning ratio. A proxy variable, used to measure the quality of firm. It is the average price earning ratio for the last two or three years before the firm's listing.
CAR-1y	Cumulative adjusted return after one year, In order to observe the effect of one year after market performance, and its relation with under-pricing (MAAR).

Table 2: Basic Descriptive Statistics:

Panel A: Number of Shares Offered (in million).

Listing Year	No. of IPOs	Mean	Median	Std. Dev	Min.	Max.
2000	1	18.50	-	0.00	18.50	18.50
2001	2	27.63	27.63	37.30	1.25	54.00
2002	5	19.77	13.20	12.01	10.00	37.30
2003	6	27.86	21.40	20.44	10.00	63.27
2004	15	56.32	30.00	59.09	7.50	215.05
2005	19	24.10	15.00	22.76	4.00	88.03
April-2006	2	33.05	33.05	11.38	25.00	41.10
Full Sample	**50**	**29.60**	**22.68**	**23.28**	**10.89**	**73.89**

Panel B: Offer Price (Pakistani Rupees).

Listing Year	No. of IPOs	Mean	Median	SD	Min.	Max.
2000	1	10.00	-	0.00	10.00	10.00
2001	2	45.00	45.00	49.50	10.00	80.00
2002	5	10.00	10.00	0.00	10.00	10.00
2003	6	10.00	10.00	0.00	10.00	10.00
2004	15	16.80	10.00	12.93	10.00	55.00
2005	19	20.57	10.00	16.47	10.00	57.75
2006	2	12.50	12.50	3.54	10.00	15.00
Full Sample	**50**	**17.84**	**15.36**	**11.78**	**10.00**	**33.96**

Panel C: Capital Raised (in million Pakistani Rupees).

Listing Year	No. of IPOs	Mean	Median	SD	Min.	Max.
2000	1	185.00	-	0.00	185.00	185.00
2001	2	320.00	320.00	311.13	100.00	540.00
2002	5	197.70	132.00	120.13	100.00	373.04
2003	6	278.61	214.00	204.39	100.00	632.72
2004	15	1,239.96	300.00	2,090.58	100.00	6,881.48
2005	19	521.27	250.00	760.52	40.00	2,640.75
2006	2	433.25	433.25	259.15	250.00	616.50
Full Sample	**50**	**453.68**	**262.04**	**535.13**	**125.00**	**1,695.64**

Panel D: Subscription Rate (number of shares subscribed / shares offered).

Listing Year	No. of IPOs	Mean	Median	SD	Minimum	Maximum
2000	1	1.22	-	0.00	1.22	1.22
2001	2	2.18	2.18	3.07	0.01	4.35
2002	5	0.81	0.31	1.11	0.15	2.77
2003	6	2.24	1.23	1.96	0.64	5.61
2004	15	2.66	1.16	2.64	0.07	9.67
2005	19	2.34	1.12	4.41	0.02	18.67
2006	2	1.52	1.52	1.10	0.75	2.30
Full Sample	**50**	**1.85**	**1.25**	**2.04**	**0.41**	**6.37**

Panel E: Karachi Stock Exchange Index.

KSE Index	No of performance	Mean	Median	SD	Min.	Max.
Open	1,466	4,030.2	2,949.5	2,806.6	1,075	12,062
High	1,466	4,068.5	2,978.5	2,836.0	1,097	12,142
Low	1,466	3,993.9	2,930.0	2,777.8	1,070	12,045
Close	1,466	4,033.3	2,955.5	2,809.2	1,075	12,137

Continued Table 2.

Panel F: Characteristics of Variables used in Regression & Correlation Analysis.

Variables	No. of IPOs	Mean	Median	SD	Minimum	Maximum
MAAR	50	0.35	0.15	0.67	(1.17)	3.29
PSO	50	0.27	0.25	0.18	0.05	1.00
Over-Sub	50	2.22	1.14	3.18	0.01	18.67
Ln (size)	50	5.73	5.52	1.07	3.69	8.84
PE	50	16.43	9.36	21.63	(19.50)	91.50
Ln (Mkt-Cap)	50	7.42	7.05	1.55	4.62	12.35
MV	50	363.91	265.63	263.66	34.83	1,089.07
Ex-Ante	50	0.12	0.06	0.13	0.02	0.73
SI	50	0.02	0.00	0.14	0.00	1.00
CARs-M	36	(0.20)	(0.39)	0.65	(0.11)	0.23

Panel G: One-year After Market Performance of IPOs.

	No of obs.	Mean	Median	SD	Min.	Max.
1. Cumulative Abnormal Returns using Market Adjusted Model						
CARs-M (%)	8,640	(19.67)	(38.66)	64.96	(106.71)	232.67
CARs-By-W (%)	8,640	(21.61)	(36.93)	55.04	(110.36)	142.18
CARs-W (%)	8,640	(21.57)	(36.64)	52.37	(104.59)	109.86
2. Buy and Hold Abnormal Returns using Market Adjusted Model						
BHARs-M (%)	8,640	(38.10)	(48.20)	49.46	(112.12)	94.07
BHARs-By-W(%)	8,640	(37.53)	(53.17)	50.95	(113.18)	91.17
BHARs-W (%)	8,640	(37.32)	(52.36)	52.22	(113.15)	90.09
3. Cumulative Abnormal Returns using Capital Asset Pricing Model						
CARs-M (%)	8,640	(53.30)	(65.23)	60.39	(143.87)	189.22
CARs-By-W (%)	8,640	(57.67)	(61.48)	54.35	(150.12)	77.56
CARs-W (%)	8,640	(67.57)	(65.93)	84.27	(240.32)	131.10
4. Buy and Hold Abnormal Returns using Capital Asset Pricing Model						
BHARs-M (%)	8,640	(65.73)	(70.80)	39.70	(131.33)	72.97
BHARs-By-W(%)	8,640	(68.59)	(67.70)	41.43	(134.64)	50.06
BHARs-W (%)	8,640	(66.19)	(77.85)	65.49	(154.58)	200.92