An Empirical Study on Internet IPO Performance

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Abstract

This study analyzes the performance of large 86 IPO Internet firms during the period 1993-2013. The study documented an average initial one-day return of 29.82% for internet IPOs. The one-year average buy and hold return for IPO stocks was 30.86 %. The excess five year buy and hold return for IPO internet stocks averaged approximately 60.72% compared with the market index. On a comparative basis, the returns for the IPO internet stocks have increased in magnitude substantially during the five-year period after listing. The average initial one-day return was higher for Nasdaq listed Internet firms compared to NYSE listed stocks. But the five year buy and hold return for internet stocks listed in the NYSE was approximately three times that of Nasdaq listed stocks. The regression results documents evidence to show that size is positive related to IPO returns. The study suggests that the long term returns (five year buy and hold excess return) is lower for firms listed during the recession and dot com bubble period.

Keywords: IPO, Average returns, Buy & hold returns, Underpricing, Dotcom bubble

1. Introduction

Underwriting and Stabilization process in an IPO are facilitated by the underwriters. A company which intends to go public will prepare detailed business plan and hire investment bankers as underwriters for the issue. The lead underwriter would file the prospectus with the securities and exchange commission detailing the intend to offer securities to the public. The prospectus would contain financial information and other information like background of the board of directors, level of competition and the intended use of proceeds. The lead underwriter creates a syndicate to place the shares. After the registration process with Securities Exchange Commission, the preliminary prospectus is distributed to solicit interest from potential investors. Through book building process, the indications regarding the price and number of shares to be offered are estimated. A final prospectus is then made and distributed to investors.The lead underwriter and the firm's management finalizes the offer size and offer price of the shares.

IPO Underpricing is basically related to asymmetric information about security's value and fundamental risk. In the context of uncertainty about a share's value, the issuer must leave enough money "on the table" to compensate investors. Many models explain IPO underpricing with some form of information asymmetry. IPO underpricing aims to attract investors. The assumption made is that the enlarged pool of widely dispersed shareholders raises the valuation of the firm by creating liquidity in the aftermarket. Underwriters aims for price stabilization by discouraging their investors from selling in the immediate aftermarket. If the price begins to fall after listing, underwriters can purchase shares. If the underwriter has overallotment option, they would frequently oversell issues. The overallotment option facilitates underwriters to obtain an additional specified percentage of shares at the offer price. Hence the underwriter oversells the issue and exercise the option to fulfill sales if the price rises in early aftermarket trading. If the price falls in early aftermarket trading, the underwriter can purchase the shares in the market to stabilize the price. In this case the underwriter does not exercise the overallotment option. The presence and size of overallotment option limits the downside potential by means of increasing demand. Underwriters also prevent price reductions by imposing lock up agreements whereby investors are required to hold their shares for a specified amount of time. Lead underwriters also influence their syndicate members through penalty bids. If underwriters receive compensation from both the issuer (the gross spread) and investors, they have an incentive to recommend a lower offer price than if the compensation was merely the gross spread.

The spinning theory of IPO underpricing explains why underwriters and issuing firm managers prefer to forego net proceeds by leaving money on the table rather than pay a higher gross spread. Money on the table is the currency by which underwriters can influence other venture capitalists and issuing firm executives. In 1999-2000, the average amount of money left on the table of $85 million per IPO adds up to $68 billion (Loughran, 2004).

Internet have emerged as a technological force for every industry to refocus their business practices. Technology changes and the potential entry by new competitors results in uncertainty in the internet environment. Internet firms are characterized by higher level of

risk. Hence it can be assumed that underwriters would facilitate for additional underpricing at the time of issue for internet IPOs. Internet stock IPOs led to the IPO boom in the late 1990s.More than half of the Internet IPOs were backed by the venture capitalists during the period 1996-2001.The first web browser Netscape went public on August 1 1995 and the underpricing was to the extent of 108% on the first day of trading. In 1996, Yahoo went public and the market value reached $1 billion within one year. In 1997, Amazon the first e commerce company went public.

1.1 Objective of the Study

The study aims to determine the degree of underpricing of internet firms at the time of IPO. The study also focuses on examining the factors determining the IPO returns and the characteristics of IPOs. The study also analyses the aftermarket performance of the internet firms with respect to different duration of time.
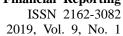
2. Literature Review

Baron (1982) suggests that the issuing company knows less about the true value of the firm compared to the investment banker. Benveniste and Spindt (1989) point out that the issuer firms derive information from the underwriter investment bank through the process of book building. Welch (1992) points that issuers underprice IPO shares to attract potential investors in the IPO whose bids will in turn attract other investors. Underwriters would be motivated to underprice the IPO to achieve the multiple goals of satisfying the investors, the shares are placed and also to attract the same investors to participate in future seasoned equity offerings by the issuing firm. Booth and Chua (1996) suggest that the IPO underpricing basically focuses on attracting potential investors. Higher underpricing should lead to greater liquidity (Booth and Chua 1996). The presence of venture capitalist can be a quality signal which leads to lower underpricing (Barry et al, 1990; Megginson and Weiss, 1991). Rock (1986) suggests that among potential IPO investors some are informed and others "uninformed" This informational asymmetry might induce investors to rely on other buyers' behavior in placing their bids.

Ritter (1984) finds that initial IPO returns can vary from sector to sector. The study observes that in the 1980s, there had been high initial IPO returns in the natural gas industry IPOs. Ritter (1984) suggests that initial returns are directly related to the uncertainty of the IPO.

Ellul and Pagon (2006) find that IPO underpricing is higher for shares which have lower expected liquidity and higher liquidity risk.

Schultz and Zaman (2000) discuss the motives by the issuer to go public. The study by Bartov et al (2001) aims to identify the factors that drive the pricing of Internet IPOs. The initial valuation of internet operations is a challenging task for underwriters in the context of growth of internet operations. The degree of underpricing is related to the uncertainty. The study by Beatty and Ritter (1986) suggest that the initial returns for IPOs are due to uncertainty. The informed investors will invest in IPOs that are underpriced and oversubscribed. DuCharme et al (2001) finds that the determinants of internet underpricing include characteristics like degree of media attention and the attractiveness of future seasoned

offerings. Ljungqvist and Wilhelm (2002) suggest that the shift in initial returns of IPOs in the late 1990s can be attributed to the internet characteristics of the issuing firms. Ander Goot et al (2001) suggest that the pricing of internet IPOs in European markets are partially influenced by hot markets. Ruud (1993) finds that one fourth of IPOs have very low returns and prices decline basically due to lack of underwriter support. Few studies have addressed the impact of board structure on IPO price performance (Finkle, 1998, Yatim, 2011). Dolvin et al (2016) find that the only board characteristic that is significantly related to IPO initial return is the percentage of external directors.

2.1 Review of Studies on IPO Returns

Ibbotson and Jaffe (1975) documented an initial return of 11.4% based on sample period 1960-1969. Reilly (1975) documented initial return of 11 % based on the sample period 1972-1975. Ritter (1984) documents mean return of 18.8% for a sample of 5000 IPOs during the period 1960-1982.The same study finds that the average initial return was as high as 48.4% during the period 1980-1981. Barry and Jennings (1993) find that 90 per cent of the initial returns was attributed to opening price (Note 1) and hence accrued to only subscribers. This study finds that the market corrects the mispricing by the underwriters and only subscribers are able to earn high initial returns. In other words, investors who are not allocated any shares will not earn excess initial returns by investing at the opening price. The IPO underpricing doubled from 7% during the 1980-1989 to almost 15% during the 1990-1998 before reverting back to 12 percent during the post bubble period of 2001. (Loughran and Ritter, 2004)

Aggarwal and Rivoli (1990) find that returns are significantly less than the market for one-year period following the IPO issue. This study suggests that mispricing occurs in early trading of IPOs when investors drive up the price to irrational levels. Ritter (1991) compares the three year returns of firms engaged in IPOs during the period 1975-1984 and finds that the IPOs significantly underperform both the market benchmarks and matching firms in the aftermarket. Loughran and Ritter (1995) find weak performance over a period of five years using a sample of approximately 5000 companies which had IPOs. Underpricing is inversely related to underwriter reputation (Johnson and Miller, 1988; Beatty and Ritter, 1986; Carter and Manaster, 1990).

2.2 Hypothesis

There exists greater extent of underpricing for Internet firm IPOs due to the uncertainty of the IPOs. The initial returns are higher for internet IPOs. Internet IPOs have higher abnormal initial returns. Negative relationship is expected between the age of internet firms and the IPO underpricing. It is also hypothesized that larger the offer price, offer size, proceeds limit the initial returns as the uncertainty is reduced. Hence a negative relationship is expected between the offer size and returns from IPO. Larger the size of the internet firm, greater is the underpricing of the internet IPOs. The IPO returns will be higher during boom and dotcom period.

3. Methodology

3.1 Sample Design

The source of data was Ritter IPO Database. The sample was chosen from a comprehensive list of Internet companies which went through IPO process. The study period chosen was 1990-2013.The time period was restricted till the year 2013 since the study involved the calculation of five year buy and hold return. The initial sample size was 678.The sample size was further truncated as companies delisted and those which were involved in merger and acquisition were removed from the sample. The final sample selection criteria involved the selection of IPOs with offer size greater than \$10.The final sample size was 86. These companies are currently listed in NASDAQ or NYSE.

3.2 Research Design

We used cross sectional regression to examine the determinants of underpricing. We base the multivariate analysis on the following six OLS regression models.

$$IR = \alpha + \beta_1 \, LnTA + \beta_2 \, LnSA + \beta_3 \, FAge + \beta_4 \, Ln \, IPOProceeds + \beta_5 \, LnMLT + \beta_6 \, Ln \, OS$$
$$+ \beta_7 \, Ln \, OP + \beta_8 \, NYSE + \beta_9 \, NASDAQ + \beta_{10}BM + \beta_{11} \, REC + \beta_{12}DOTBUB \qquad \text{Model 1}$$

$$IRDR = \alpha + \beta_1 \, LnTA + \beta_2 \, LnSA + \beta_3 \, FAge + \beta_4 \, Ln \, IPOProceeds + \beta_5 \, LnMLT + \beta_6 \, Ln \, OS$$
$$+ \beta_7 \, Ln \, OP + \beta_8 \, NYSE + \beta_9 \, NASDAQ + \beta_{10}BM + \beta_{11} \, REC + \beta_{12}DOTBUB \qquad \text{Model 2}$$

$$HPR = \alpha + \beta_1 \, LnTA + \beta_2 \, LnSA + \beta_3 \, FAge + \beta_4 \, Ln \, IPOProceeds + \beta_5 \, LnMLT + \beta_6 \, Ln \, OS$$
$$+ \beta_7 \, Ln \, OP + \beta_8 \, NYSE + \beta_9 \, NASDAQ + \beta_{10}BM + \beta_{11} \, REC + \beta_{12}DOTBUB \qquad \text{Model 3}$$

$$HPRER = \alpha + \beta_1 \, LnTA + \beta_2 \, LnSA + \beta_3 \, FAge + \beta_4 \, Ln \, IPOProceeds + \beta_5 \, LnMLT + \beta_6 \, Ln \, OS$$
$$+ \beta_7 \, Ln \, OP + \beta_8 \, NYSE + \beta_9 \, NASDAQ + \beta_{10}BM + \beta_{11} \, REC + \beta_{12}DOTBUB \qquad \text{Model 4}$$

$$WR_1 = \alpha + \beta_1 \, LnTA + \beta_2 \, LnSA + \beta_3 \, FAge + \beta_4 \, Ln \, IPOProceeds + \beta_5 \, LnMLT + \beta_6 \, Ln \, OS$$
$$+ \beta_7 \, Ln \, OP + \beta_8 \, NYSE + \beta_9 \, NASDAQ + \beta_{10}BM + \beta_{11} \, REC + \beta_{12}DOTBUB \qquad \text{Model 5}$$

$$WR_5 = \alpha + \beta_1 \, LnTA + \beta_2 \, LnSA + \beta_3 \, FAge + \beta_4 \, Ln \, IPOProceeds + \beta_5 \, LnMLT + \beta_6 \, Ln \, OS$$
$$+ \beta_7 \, Ln \, OP + \beta_8 \, NYSE + \beta_9 \, NASDAQ + \beta_{10}BM + \beta_{11} \, REC + \beta_{12}DOTBUB \qquad \text{Model 6}$$

Size and market related characteristics are factors to be considered for IPO returns. Larger offerings are issued by larger firms which are scrutinized in depth by analysts. Hence such offerings reduce the uncertainty surrounding the IPO and lowers the expected returns. In other words, the IPO would be fairly valued during issue period. The pre IPO market conditions is a factor to be considered for initial returns. The initial return could vary based on the mood of the market surrounding the IPO event period. In boom period, the returns are expected to be higher compared to the recession period. The market for internet firms had declined significantly at the end of March 2000.

The dependent variable is IPO underpricing (returns) measured by different measures. The

measures for IPO returns are basically based on pre-market and after market returns. The pre-market returns were proxied by initial returns and intraday returns. The aftermarket returns were represented by variables of buy hold return and wealth relative. Initial Return (*IR*) is the initial return calculated from the offering price to the close of the first day of trading. Intraday Return(*IRDR*) are estimated as the difference between the opening and closing price on the first day of trading. The buy and hold return (*HPR*) based on five years is calculated with respect to the opening price on the day of listing. The buy and hold excess return (*HPRER*) for five years is based on the difference between the buy and hold return for the internet stock and the market index DJI Nasdaq composite for the five-year period. Wealth Relative are computed by $\sum(1+Rit)/\sum(1+RIndex)$ where Rit is the buy and hold return for IPOi for period t. Index is the buy and hold return for the index for period t. Wealth Relative is estimated for period of one year (*WR₁*) and five year (*WR₅*).

Size is measured as the natural log of total assets (*LnTA*) and natural log of total sales(*LnSA*). Total Assets is the log of the sum of fixed assets and current assets in the year preceding the IPO in million dollars. Total sales given in million dollars are also based in the year preceding the IPO. Firm Age (*FAge*) is the log of the number of years from the firm's original corporation to the time of IPO. Size of IPO is the log of the total IPO proceeds (*Ln IPOProceeds*). Money left on the table is calculated by multiplying the difference between the opening price and the offer price by the offer size of the stock, which gives an indication of whether the issue is underpriced. Money left on table is represented by the variable (*LnMLT*). The offer size is the volume traded on the first day of IPO listing. The variable for offer size is the natural log of offer size (*Ln OS*). The offer price of the IPO is included as an independent variable (*Ln OP*) which is the natural log of offer price. Dummy variables for stock market where the IPO listing took place were also included in the models. *NYSE* dummy variable equal to 1 was included if the stock was listed in New York Stock Exchange. *NASDAQ* dummy variable equal to 1 was included if the stock was listed in NASDAQ. Dummy variables representing economic conditions of boom, recession and dot com bubble (*BM, REC, DOTBUB*)were also included in the regression models.

Table 1. Descriptive statistics

	Mean	Median	Max	Min	Stddev
Offer Size	37.58	6.34	940.64	0.09	128.27
Money Left on table	53.25	8.05	15041.02	-16865.62	2494.57
IPO Proceeds	548.40	87.24	16931.46	1.00	2083.89
Total Assets	1507.63	150.00	42737.00	6.60	5428.35
Total Sales	1035.77	106.30	38779.00	0.40	4547.62
IPO Age	12.37	12.00	22.00	5.00	5.65

The values are given in millions of dollars. There were huge fluctuations in the IPO proceeds

and money left on table. Google IPO had the highest offer price of $85.Cisco Systems IPO had the highest offer size of $940.46 million. eBay IPO had the largest money left on table which amounted to $15041.02 million. The maximum IPO proceeds of $ 16931.46 million was accounted by Cisco System IPO.

Table 2. IPO statistics and magnitude of IPO underpricing

Year	No of IPOs	Offer Price(Average)	Market Price(Average)	Sales(in Million USD)(Average)	Magnitude of Underpricing
1990	1	18	22.32	70	24%
1994	1	13	5.95	56.7	-54%
1996	1	10.5	29.38	51.6	180%
1997	2	12.25	18.44	83.55	51%
1998	2	16	26.095	42.95	63%
1999	17	16.5	127.95	2373.38	675%
2000	6	13.17	127.71	9.56	870%
2001	1	12	13.16	773.7	10%
2002-2006	15	18.57	30.67	445.54	65%
2007-2012	28	15.18	18.77	460.43	24%
2013	12	16.33	27.55	2295.83	69%

The market price on the day of listing was taken for calculation. *On average basis, the year 1999 and 2000 witnessed the highest underpricing/initial IPO returns of 675% and 870% respectively.* This period represented the dot com bubble period. The average initial returns were negative in the year 1994.

Table 3. Average IPO return statistics: initial and intraday returns

Average	One day	Two day	Three day
Initial Return	29.82%	25.88%	35.11%
Intraday Return	5.74%	0.14%	

The study documented an average initial one-day return of 29.82% for internet IPOs. The average one-day intraday return was 5.74%. The three-day average initial return was 35.11%.

Table 4. Average IPO return statistics: buy & hold return and wealth relative analysis

Average	1 Year	3 Year	5 Year
Buy and Hold Return for IPO Stocks (a)	30.86%	-50.67%	102.70%
Buy and Hold Returns for market Index Nasdaq(b)	14.64%	18.09%	41.98%
Excess Returns (a-b)	16.20%	-67.97%	60.72%
Wealth Relative	3.96	3.50	-1.05

The one-year average buy and hold return for IPO stocks was 30.86 %. The five-year average buy and hold return peaked at 102.70%. On the basis of average one year and five year buy and hold return, the IPO Internet stocks outperformed the market index while underperformed the market index on the basis of average three year buy and hold return. The excess five buy and hold return for IPO internet stocks averaged approximately 60.72% compared with the market index.

Table 5. Average IPO returns based on stock market and economic conditions

Average	Initial Return-Day1	Buy & Hold Return-5 Year	Wealth Relative-1 Year	Wealth Relative-5 Year
Nasdaq	43%	30%	2.29	4.56
NYSE	33%	84%	6.38	-16.82
Boom	59%	86%	-1.42	0.82
Recession	8%	70%	14.25	-61.71
Dotcom Bubble Period	46%	31%	1.14	-9.11

The average initial one-day return for internet stocks listed in Nasdaq market was 43% compared to 33 % for stocks listed in the NYSE. The five year buy and hold return for internet stocks listed in the NYSE was approximately 84%. On a comparative basis, the returns for the IPO internet stocks have increased in magnitude substantially during the five-year period after listing.

The average initial one-day return was higher for Nasdaq listed Internet firms compared to NYSE listed stocks. But the five year buy and hold return for internet stocks listed in the NYSE was approximately three times that of Nasdaq listed stocks. The IPO stocks listed in the NYSE had superior stock market performance compared to those listed in the Nasdaq stock market. The average initial one-day return for internet stocks in the boom, recession

and dotcom bubble period was approximately 59%,8% and 46% respectively. The average five year buy and hold period return for the internet stocks in the boom, recession and dotcom bubble period was approximately 86%, 70% and 31% respectively.

Table 6. Regression results

Coefficient/t statistics	Model 1	Model 2	Model 3	Model4	Model 5	Model 6
Intercept	1.91	-0.49	-4.54	-4.31	-40.55	8.6
	1.13	-1.08	-1.18	-1.16	-0.98	0.094
Ln OP	0.012	-0.0038	0.004	0..007	-0.54	0.54
	0.86	-1.02	0.144	0.26	-1.63	0.728
Ln OS	-0.13	-1.03	-0.41	-0.43	4.32	-0.20
	-0.77	**-2.29****	-1.10	-1.17	1.07	-0.0228
Ln MLT	0.16	0.02	-0.07	-0.091	0.16	2.28
	2.6**	1.64	-0.52	-0.65	0.10	0.662
Ln IPO Proceeds	-0.12	0.097	0.77	0.78		4.98
	-0.72	**2.11****	1.97	**2.06****	-2.35	0.537
					-0.566	
Ln TA	-0.01	-0.022	-0.20	-0.16	0.24	-8.91
	-0.086	-0.74	-0.78	-0.66	0.09	-1.45
Ln SA	-0.11	0.0557	0.24	0.19	0.072	-1.39
	-1.23	**2.27****	1.16	0.94	0.032	-0.27
FAge	0.016	0.005	0.03	0.044	0.15	0.27
	0.322	0.39	0.26	0.39	0.12	0.101
NYSE	-0.47	-0.232	-1.68	-1.91	37.8	-81.23
	-0.48	-0.87	-0.75	-0.88	1.58	-1.52
NASDAQ	-0.24	-0.25	-2.27	-2.56	31.44	-55.8
	-0.25	-0.97	-1.02	-1.2	1.33	-1.06
BM	0.92	-0.041	0.78	0.055	-18.33	-17.80
	1.99*	-0.332	0.74	0.054	-1.62	-0.71
REC	0.071	-0.029	0.31	0.067	8.4	-86.12

	0.165	-0.25	0.32	0.071	0.79	**-3.66***
DOTBUB	0.137	0.100	0.21	0.52	-13.52	-44.95
	0.319	0.86	0.22	0.54	-1.29	**-1.92***

Variables of size, market and economic characteristics were regressed upon short term and long term returns of the IPO. The study provides some documented evidence to show that size is positively related to IPO returns. Based on Model 2 and Model 4 results, it can be suggested that greater the size of IPO proceeds, greater is the return generation for the IPO stock in the market. In model 2, the intraday return was positively related to the size of IPO proceeds with statistical significance at 5% and 10%. The coefficient value was 0.097 with t value equal to 2.11. In model 4, the dependent variable of five year buy and hold excess return (HPRER) was positively related to the size of IPO proceeds with statistical significance at 5% and 10% (coefficient 0.78 and t value 2.06). Model 1 results suggest that the initial IPO returns were positively related to the money left on the table. The initial IPO return variable had statistically significant relationship with the size variable Ln MLT (t value =2.6 with statistical significance at 5% and 10%). Model 2 results suggest internet IPO firms with large revenues provide higher returns. The dependent variable of intraday return(IRDR) was positively related to sales variable of Ln SA with statistical significance at 5% and 10%. The coefficient was 0.0557 and t value 2.27. In model 2, the variable of offer size was negatively related to the return variable (t value =-2.29 with statistical significance at 5% and 10%). This finding provide some evidence for the hypothesis that the uncertainty surrounding large IPO listing is less and hence results in lower returns. According to Model 1 results, the initial IPO returns are larger for firms which had IPO listing in the boom period. Model 6 results suggest that the long term returns (five year buy and hold excess return) is lower for firms listed during the recession and dot com bubble period.

4. Summary

This study analyzes the performance of large 86 IPO Internet firms during the period 1993-2013.The study examines the magnitude of underpricing in Internet IPOs. The study also focusses on understanding the size, market and economic determinants of IPO returns. The study uses cross sectional regression to examine the determinants of IPO performance. Six OLS regression models were employed to examine the determinants of short term and long term performance of IPO internet firms. The study documented an average initial one-day return of 29.82% for internet IPOs. The average one-day intraday return and three days average initial return was 5.74%. and 35.11% respectively. The one-year average buy and hold return for IPO stocks was 30.86 %. The excess five buy and hold return for IPO internet stocks averaged approximately 60.72% compared with the market index. On a comparative basis, the returns for the IPO internet stocks have increased in magnitude substantially during the five-year period after listing. The average initial one-day return was higher for Nasdaq listed Internet firms compared to NYSE listed stocks. But the five year buy and hold return for internet stocks listed in the NYSE was approximately three times that of Nasdaq listed stocks. The IPO stocks listed in the NYSE had superior stock market

performance compared to those listed in the Nasdaq stock market. The research study provides some documented evidence to show that size is positive related to IPO returns. The study suggests that the long term returns (five year buy and hold excess return) is lower for firms listed during the recession and dot com bubble period.

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Note

Note 1. The first day return can be divided into an opening price return and an intraday return. The opening price return is calculated as the return earned from the offer price to the opening price. The intraday return is the return generated from the opening price to the closing price.