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**A Review of the New Issue Puzzles\***

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# **A Review of the New Issue Puzzles\***

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## **A Review of the New Issue Puzzles**

### **1. Introduction**

During the 1999-2000 internet bubble period, newly listed companies raised \$129.36 billion from 803 initial public offerings (IPOs) in the U.S. market. Investment banks collected from the IPO firms more than \$8 billion for their underwriting service. This \$8 billion fee looks modest, but this figure is a small fraction of the real cost to the IPO firms. Amazingly, during this two-year period the 803 IPO firms left over \$65.6 billion (or 50% of gross proceeds) of money on the table, defined as the first-day price gain multiplied by the number of shares sold. Effectively, IPO firms paid 57 cents in fees and foregone proceeds for every dollar raised as summarized in Table 1.

[Insert Table 1]

The degree of underpricing is so severe that 182 out of 803 IPOs recorded the first trading day return of 100% or higher. The average first trading day returns were 72% and 56% in 1999 and 2000, respectively. Another incredible fact is that out of 323 internet IPOs conducted in 1999-2000, only 12 are trading above their offer price and only four are above their first day close as of April 4, 2001.<sup>1</sup>

The above data raise serious concerns about the quality of information provided to the investors who subscribed to IPOs or bought the IPO stocks and seasoned equity offering (SEO) stocks on the secondary market. Against the backdrop of the tech stock collapse in the U.S. market, the main purpose of this paper is to review and summarize research findings of academic studies written on the new issues markets with a specific focus on two major anomalies in the pricing of new common stock issues: (i) the short-run underpricing phenomenon of IPOs; and (ii) the long-run underperformance phenomenon of IPOs and SEOs. This paper is not designed to formulate policy recommendations to resolve the issues presented. Rather, it presents empirical facts on the new issues market as compiled by recent academic research papers to stimulate

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<sup>1</sup> Refer to the web site of Jay Ritter of the University of Florida: <http://bear.cba.ufl.edu> and Ritter and Welch (2002).

policy issue discussions among capital market regulators participating in the OECD 4<sup>th</sup> Round Table to be held in Tokyo, Japan on April 9-10, 2002.<sup>2</sup>

This paper is structured as follows. Section 2 discusses the short-term underpricing phenomenon of IPOs. Section 3 presents the long-term underperformance of new issues. Finally, Section 4 continues with the long-term underperformance, highlighting what explains long-term overpricing of new issues.

## **2. Short-Term Underpricing Phenomenon of IPOs:**

Average first day percentage return as measured from the offering price to the first closing market price for U.S. IPOs was 24.19% during a 12-year period, 1990-2001 as summarized in Table 1. The total amount raised during this period was \$406 billion, whereas the money left on the table amounted to \$101 billion. The large amount of money left on the table and/or the significant positive difference between the first closing market price and the offering price always puzzled financial economists since the early studies by Reilly and Hatfield (1969) and Stoll and Curly (1970) documenting the IPO underpricing phenomenon.

As summarized in Table 2, the type of firms going public has changed over time. The percentage of technology firms increased from about 25% of the IPOs in the 1980s and in the first half of the 1990s to 72% in the internet bubble period. As reported in the third column of Table 2, only 19% of IPO firms had negative earnings prior to going public in the 1980s. However, this figure jumped up to 79% in 1999-2000. One worrisome fact is that mean first day returns were 72% for the IPOs with negative earnings and 43.5% for the IPOs with positive earnings during this two year period. It is indeed true that IPO firms with negative earnings produced higher returns on the first day of trading!

Several explanations have been proposed for IPO's short-term underpricing phenomenon. Baron (1982) believes that an informational asymmetry between the underwriters and the issuers

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<sup>2</sup> A large number of IPO and SEO papers published in the 1980s are not cited to focus more on recent developments in the new issues market.

causes the large first-day return. In his model, the underwriter possesses superior information concerning the possible demand for the stocks being issued, while the issuer is unable to observe the distribution efforts of the underwriter. As a result, the underwriter has an incentive to minimize his efforts in selling the issue by offering the shares at discount. However, this information asymmetry hypothesis loses its merits when Muscarella and Vetsuypens (1989) find evidence that investment bankers also underprice stocks in their own firms when going public. Rock (1986) also attributes underpricing to asymmetrically distributed information but his analysis focuses on the advantage informed investors enjoy over the uninformed. In his framework, only uninformed investors submit purchase orders for overpriced issues and they receive 100 percent of the issue, whereas both informed and uninformed investors submit purchase orders for underpriced issues and the shares are subsequently rationed between them. Thus, uninformed investors face a “winner’s curse” because they have a greater probability of being allocated shares in overpriced and undersubscribed issues rather than in underpriced and oversubscribed issues.

Allen and Faulhaber (1989), Grinblatt and Hwang (1989), and Welch (1989, 1992) propose that IPO underpricing is a mechanism for signaling firm quality: high quality issuers purposely underprice IPOs for more successful seasoned equity offerings (SEOs) in the future. However, empirical evidence on this signaling hypothesis is mixed.<sup>3</sup>

Some of past studies focus on specific factor(s) as explanatory variables for IPO underpricing. For example, Beatty and Ritter (1986) consider the level of ex-ante uncertainty surrounding the intrinsic value of an issue as a critical factor in explaining the underpricing: the greater the uncertainty the larger the underpricing. Booth and Smith (1986), Titman and Trueman (1986), Balvers, McDonald, and Miller (1988), Carter and Manaster (1990), and Carter, Dark, and Singh (1998) suggest that the quality of advising agents (e.g., investment bankers,

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<sup>3</sup> Refer to Garfinkel (1992), Michaely and Shaw (1994), and Jain and Kini (1994).

accountants, auditors) is negatively related to IPO underpricing levels. Tinic (1988) and Hughes and Thakor (1992) propose that the underpricing represents an insurance premium imposed by issuers and underwriters to avoid legal liabilities under federal securities laws for material misstatements in the offering prospectus or registration statement.

### **3. Long-Term Underperformance Phenomenon**

#### *A. Underperformance of IPO Stocks*

A recent study by Purnanandam and Swaminathan (2001) reveals an interesting result that IPOs are systematically *overvalued* with respect to their fundamentals in the long run. In a sample of more than 2,000 relatively large capitalization IPOs from 1980 to 1997, the median IPO firm is overvalued by about 50% relative to its industry peers. These results are robust to alternate price multiples, industry classifications, and matching firm selection procedures. The overvaluation observed by Purnanandam and Swaminathan is consistent with the long-run underperformance of IPOs documented by Ritter (1991), Aggarwal and Rivoli (1992), and Loughran and Ritter (1995).

Loughran and Ritter (1995) report that the average buy-and-hold 3-year [5-year] returns are 8.4% [15.7%] for IPOs, whereas a control sample of non-issuers, matched by firm size and industry, produces 35.3% [66.4%] as presented in Table 3. Their results are based on 4,753 IPOs during a 21-year study period from 1970 to 1990. The returns are measured from the closing market price on the first day of public trading to the market price on the 3<sup>rd</sup> and 5<sup>th</sup> year anniversary.

[Table 3]

The IPO underperformance anomaly is not unique to the U.S. market. Uhlir (1989) shows that German IPOs underperformed the market by 7.41% (excluding first day returns) in their first year of trading. Aggarwal, Leal, and Hernandez (1993) report three-year market-adjusted returns of -47.0%, -19.6% and -23.7% for Brazil, Mexico, and Chile, respectively. Levis (1992) reports that stock prices of UK IPO firms decline as much as 23% after adjusting for

All Share Index return during the 36-month period following the first month of trading. McGuinness (1993) also observes a significant negative return of -18.26% (after adjusting for the Hang Seng Index returns) between the close in the first day of trading and the 500<sup>th</sup> day of listing from the Hong Kong IPOs conducted during the period from 1980 to 1990. Agarwal, Liu, and Rhee (2002) report that high demand IPOs (as measured by the oversubscription ratios) suffer from larger losses than low demand IPOs on the Hong Kong Market. Cai and Wei (1997) report that five-year holding period returns are 62.1% for IPO stocks and 101.4% for matched firms in 1991-1992.

#### *B. Underperformance of SEO Stocks*

Not surprisingly, the long-run underperformance phenomenon is also observed from SEOs. Spiess and Affleck-Graves (1995) report the average 3-year [5-year] holding period return is 34.11% [55.72%] for SEO firms during 1975-1989, which contrasts with 56.95% [98.11%] for their matching firms. Cai and Loughland (1998) and Kang, Kim, and Stulz (1997) report the long-term underperformance of Japanese SEOs. For example, Cai and Loughran (1998) observe that the average buy-and-hold return over a 3-year window is 34% for issuing firms, which compares with 52% for nonissuing firms of similar market capitalization.

#### *C. Operating Performance of IPO Firms*

The long-run underperformance of IPO stocks naturally leads to questioning the issuing firms' profitability. The underperformance anomaly is also observed from operating performance of the IPO firms. Jain and Kini (1994) find that IPO firms exhibit a decline in post-issue operating performance relative to their pre-IPO levels. Based on a sample of 682 U.S. IPOs from 1976 to 1988, Jain and Kini observe that the median changes in industry-adjusted operating return on assets are -2.98%, -6.24%, -8.12%, and -6.81% (all significantly different from zero at the 1%-level) for years 0, +1, +2, and +3 relative to one year prior to IPOs. Jain and Kini (1994) also observe that the median change in asset turnover (as measured by the ratio of net sales to total assets) decreases by 23.44% over a four-year window from year -1 to +3, while net sales and

capital expenditures grow faster than matched industry firms. Despite the high sales growth and capital expenditure, the decline in asset turnover indicates that IPO firms increase their assets faster than their sales.

The results from Jain and Kini are corroborated by Mikkelsen, Partch, and Shah (1997). They report that median operating income adjusted for the performance of industry-matched firms is nine cents per dollar of assets in the year before going public and declines to negative two cents per dollar of assets by one year after going public. Purnanandam and Swaminathan (2001) also examine the ex-post operating performance of IPOs: overvalued IPOs exhibit higher sales growth rates temporarily but earn persistently lower profit margins and return on assets than undervalued IPOs over the next 5 years. This suggests that any projected growth opportunities implicit in the initial valuation fail to materialize subsequently. Cai and Wei (1997) report that Japanese IPO firms also exhibit the post-issue deterioration in operating performance.

#### *D. Operating Performance of SEO Firms*

The firms conducting SEOs have also exhibited inordinately deteriorated operating performance during the five years after the offering. Many of the issuing firms exhibit improvements in profitability before the offering but declines in operating profitability after the offering. Using a sample of 1,338 SEOs from 1979-1989, Loughland and Ritter (1997) report that: (i) the median return on assets falls from 6.3% to 3.2%; the median profit margin for issuing firms is 5.4% in the fiscal year of the offering, but the margin falls to only 2.5% in four years after the offering. All other operating performance measures usually peak at about the time of the offering, only to rapidly decline in the following years.

Consistent with the poor stock performance, Cai and Loughran (1998) find that a sample of 1,389 Japanese SEOs during the 1971-1992 period also exhibits a significant post-issue decline in operating performance. They find that median changes in matching firm-adjusted return on assets are -0.10%, -0.39%, and -0.77% from year -1 to years +1, +3, and +5, respectively.

Likewise, growth rates of capital expenditure, net sales, and operating income for SEO firms show significant declines after the offering.

#### **4. What Explains the Long-Term Underperformance of New Issues?**

Financial economists are still searching for appropriate answers to what explains the long-term underperformance of new issues, both IPOs and SEOs. This section reviews three major explanations proposed by academic research papers on this question.

A. *The “Windows of Opportunity” Hypothesis or the “Fads” Hypothesis:* Given temporary overvaluation of a firm, two hypotheses have been proposed: (i) the “windows of opportunity” hypothesis; and (ii) the “fads” hypothesis.<sup>4</sup> Although they are labeled with different titles, they are built on the same “overvaluation” phenomenon. Depending on whose viewpoint we consider, it seems that two different titles have evolved. From the managers’ viewpoint, Ritter (1991) and Loughran and Ritter (1995) propose the “windows of opportunity” hypothesis which predicts that when a firm is substantially overvalued the managers are likely to issue equity, taking advantage of the opportune time to lower the cost of capital. Loughran and Ritter rely on the observation that equity-issuing firms perform poorly following the issue rather than a theoretical foundation justifying this hypothesis.

From the viewpoint of investors, Shiller (1990) thinks that there are “fads” in the securities markets contrary to the assumption of the rational expectations models in the literature and further that the IPO market overpricing is a good case in point for the presence of fads. Camerer (1989) suggests that fads are more common if estimation of intrinsic value is more uncertain as is the case of IPOs.

Kang, Kim, and Stulz (1997) and Jung, Kim, and Stulz (1996), however, cast doubt on a temporary overvaluation corrected by the market over time as implied by the “windows of opportunity” hypothesis. Using the market-to-book equity ratio as a proxy for overvaluation, Kang, et al. (1997) find that underperformance persists even after the market-to-book equity ratio

is controlled for, which is inconsistent with the hypothesis. Jung, et al. (1996) report that size-adjusted long-term excess returns do not have any meaningful role in the logit regressions predicting whether a firm relies on equity or debt financing, which is also inconsistent with the hypothesis. Lee (1997) investigates whether or not top executives of issuing firms knowingly sell overvalued equity using U.S. SEOs. His findings are mixed, suggesting that top executives do not necessarily know the degree of overvaluation of their firms.<sup>5</sup>

On the average, it is true that IPO firms underperform the market or a matching control group of nonissuers, but the IPO literature often overlooks the fact that a large fraction of new issues exhibit better performance than the matching control group of nonissuers. The Purnanandam and Swaminathian study (2001) is one exception that investigates long-term performance of over- and under-valued IPOs. They find that overvalued IPOs become even more overvalued in the short-run exhibiting momentum, but fall back in the long run exhibiting reversals; undervalued IPOs, on the other hand, earn lower returns in the short run but earn higher returns in the long run. Both “windows of opportunity” and the “fads” hypotheses are unable to explain why there exist another group of IPO stocks that overperform the market or their counterpart nonissuers: overperformance implies underpricing at the offer.

B. *The Agency Cost Hypothesis*: Given divergence of interest between managers and shareholders, Jensen (1986) believes that managers prefer to divert the proceeds from new issues of equity or excess cash flows to investments in projects with negative net present value at the expense of shareholders' wealth. The selfish behavior undertaken by management in combination with the excess cash on firm balance sheets points to Jensen's value-destroying hypothesis.<sup>6</sup>

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<sup>4</sup> A fad is a temporary overvaluation caused by over-optimism on the part of investors.

<sup>5</sup> In contrast, Bayless and Chaplinsky (1996) provide evidence in support of the “windows of opportunity” hypothesis based on the price reaction of equity issue announcements during trading-volume based hot and cold markets.

<sup>6</sup> Jensen (1989) cites the investment behavior of Japanese corporations in the latter part of 1980s and early 1990s as a good example of firm-value-destroying activities.

Consistent with this agency cost explanation, McLaughlin, Safieddine, and Vasudevan (1996) find that the long-term decline in operating performance is greater for firms that have higher free cash flows. The IPOs and SEOs provide an interesting empirical setting in which another important hypothesis related to agency costs emerges because the interests of managers and shareholders become less closely aligned as managers' stakes decrease and ownership becomes more dispersed [Jensen and Meckling (1976)]. As a result, an issuing firm's performance should suffer after going public or SEO. Jain and Kini (1995) find a significant positive relation between post-IPO operating performance and equity retention by the original entrepreneurs. In contrast, Mikkelsen, Partch, and Shah (1997) report that the operating performance of IPO firms is unrelated to changes in stock ownership by managers.

In a similar line of logic, Cai and Loughran (1998) predict that a negative relation exists between the level of agency costs prior to new issues and subsequent changes in performance because new equity issues often decrease the proportion of equity owned by managers thereby diminishing the managers' incentives for value maximization. Cai and Loughran use Japanese SEOs to test their prediction, but find no evidence that declines in long-term performance are in any way related to changes in incentive schemes resulting from reduced managerial ownership or lowered ownership concentration following the offering, which is consistent with the U.S. evidence of Mikkelsen, et al. (1997). Unfortunately, Cai and McLaughlin (1998) and Mikkelsen et al. (1997) do not provide satisfactory answers to what they observe in the U.S. and Japanese markets, respectively.

C. *The Earnings Management Hypothesis*: One peculiar observation from various statistical data compiled by the past studies is that both IPO and SEO firms exhibit unusually large and significant gains in operating performance above and beyond the industry average or the control group of matched nonissuers one year prior to the offer date [Jain and Kini (1995) and Cai and Loughran (1998)]. We also observe that SEO firms in the year prior to the offering provide a

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total return of 72% [Loughran and Ritter (1995)]. This observation leads us to suspect the presence of aggressive earnings management that is intended to lead investors to be overly optimistic about the issuer's prospects. When initial high earnings cannot be sustained, disappointed investors revalue the firm down to a level justified by the fundamentals [Teoh, Welch, and Wong (1998)]. Decomposing net income into cash flow from operations and accruals from accounting adjustments, Teoh et al. (1998) find that post-issue underperformance in net income is caused by accruals. When accruals are further decomposed into four categories by time period (current and long-term) and manager control (discretionary and nondiscretionary), Rangan (1998) and Teoh et al. (1998) find that discretionary current accruals drive the post-issue earnings underperformance and predict underperformance in post-issue stock performance.

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**Table 1**  
**U.S. IPO Statistics**

<u>Year</u>	<u>Number of IPOs</u>	<u>Average First Day Return</u>	<u>Number of IPOs with Return &gt;100%</u>	<u>Money Left on the Table</u>	<u>Gross Proceeds</u>
1990	104	10.8%	1	\$454 million	\$5,611 million
1991	273	12.1%	0	1,788	15,923
1992	385	10.2%	2	2,148	26,373
1993	483	12.8%	2	3,915	34,422
1994	387	9.8%	1	1,650	19,323
1995	432	21.5%	13	5,033	28,347
1996	621	16.7%	7	7,383	45,940
1997	432	13.8%	2	4,644	31,701
1998	267	22.3%	12	5,352	34,628
1999	457	71.7%	111	37,943	66,770
2000	346	56.1%	71	27,682	62,593
2001	80	14.0%	0	2,973	34,344
<b>Total</b>	<b>4,267</b>	<b>24.19%</b>	<b>222</b>	<b>\$100,988</b>	<b>\$405,972</b>
1980-89	1,982	7.4%	9	\$5,409	\$82,476
1990-94	1,632	11.2%	6	9,954	101,652
1995-98	1,752	18.1%	34	22,436	140,613
1999-20	803	65.0%	182	65,625	129,363
2001	80	14.0%	0	2,973	34,344

Source: Adapted from Ritter and Welch (2002)

**Table 2**  
**IPOs with Negative Earnings (1980-2000)**

<u>Period</u>	<u>Number of IPOs</u>	<u>Percentage Tech Stocks</u>	<u>IPOs with Negative EPS</u>	<u>Mean 1<sup>st</sup> Day Returns</u>	
				<u>EPS&lt;0</u>	<u>EPS&gt;0</u>
1980-1989	1,982	26%	19%	9.1%	6.8%
1990-1994	1,632	23%	26%	10.8%	11.4%
1995-1998	1,752	37%	37%	19.2%	17.4%
1999-2000	803	72%	79%	72.0%	43.5%
2001	80	29%	49%	13.3%	11.6%
1980-2001	6,249	34.5%	34%	31.4%	12.5%

Source: Ritter and Welch (2002)

**Table 3**  
**Long-Term Stock Performance of New Issues**

<u>Period</u>	<u>Author</u>	<u>Type</u>	<u>Number of Sample</u>	<u>Issuer</u>	<u>3-Year Return</u>		<u>5-Year Return</u>	
					<u>Nonissuer</u>	<u>Issuer</u>	<u>Nonissuer</u>	<u>Issuer</u>
<i>A. US Market</i>								
1970-1990	L&R <sup>1</sup>	IPO	4,753		8.4%	35.3%	15.7%	66.4%
1970-1990	L&R <sup>1</sup>	SEO	3,702		15.0%	48.0%	33.4%	92.8%
<i>B. Japanese Market</i>								
1971-1992	C&W <sup>2</sup>	IPO	180		34.2%	82.9%	62.1%	101.4%
1971-1992	C&L <sup>3</sup>	SEO	1,389		33.7%	51.5%	74.1%	112.9%
<i>C. UK Market</i>								
1980-1988	Levis <sup>4</sup>	IPO	806		55.7%	97.8% <sup>5</sup>	n.a.	

Notes:

1. L&R = Louhran and Ritter (1995)
2. C&W = Cai and Wei (1997)
3. C&L = Cai and Louhran (1998)
4. Levis = Levis (1990)
5. All Share Index Return