THE MARKET'S PROBLEMS WITH THE PRICING OF INITIAL PUBLIC OFFERINGS

*by Roger G. Ibbotson and Jody L. Sindelar, Yale University, and Jay R. Ritter, University of Illinois**

Over the last decade, an average of two firms have gone public in the U.S. each business day, and thousands of additional firms have done the same in other countries. Most companies start out by raising equity capital from a small number of investors, with no liquid market to accommodate those investors who wish to sell their stock later. If a company prospers and needs additional equity capital, at some point it generally finds it desirable to go public by selling stock to a large number of diversified investors. Publicly traded stock has greater liquidity, which allows the company to raise capital on more favorable terms than if it were privately held.

The pricing of inital public offerings (IPOs) is difficult, both because there is no observable market price prior to the offering and because many of the issuing firms have little or no operating history. If the price is set too low, the issuer does not get the full advantage of its ability to raise capital. If it is priced too high, then the investor would get an inferior return and consequently might reject the offering. Investors, moreover, would be unwilling to purchase offerings from an investment banker with a record of overpriced offerings. Without accurate pricing, the market could wither as one side or the other is unsatisfied. Without a healthy market for IPOs, young growth companies would have only limited access to the public in raising capital.

This article describes recent evidence that indicates that the market has a great deal of difficulty in valuing these firms appropriately. In particular, there are three anomalies associated with IPOs: (1) first-day returns that average 10-15%, (2) cycles in both the volume of new issues and the magnitude of first-day returns, and (3) long-run underperformance. The empirical evidence on the pricing of IPOs provides a puzzle to those who otherwise believe in efficient capital markets. We argue that these anomalies are interrelated in the following sense: periodic overoptimism by investors creates "windows of opportunity" during which many firms rush to market, which results in disappointing returns to long-term investors when the issuers fail to live up to overly optimistic expectations. In contrast, firms that issue during low-volume periods typically experience neither high initial price run-ups nor subsequent long-run underperformance.

The above patterns, moreover, are much more pronounced for smaller, younger companies going public than for their older, more established counterparts. This finding is consistent with other evidence suggesting inefficiencies in markets for smaller-cap stocks.

---

*This article updates our "Initial Public Offerings," in the Summer 1988 *Journal of Applied Corporate Finance*. It draws heavily on "Initial Public Offerings" by Roger G. Ibbotson and Jay R. Ritter in *North-Holland Handbooks of Management Science: Finance* and "Going Public," by Kathleen Weiss Hanley and Jay R. Ritter, in *The New Palgrave Dictionary of Money and Finance*. We thank Prof. Hanley for permission to draw on material from this related work.

SPRING 1994, VOL. 7, NO. 1

PATTERNS IN INITIAL RETURNS

The best-known anomaly associated with the process of going public is the large *initial* returns—that is, the price changes measured from the offering price to the market price either at the end of the first day or within a few weeks of the offering date—accruing to investors in IPOs of common stock. There is a large empirical literature documenting IPO underpricing that can be traced back to a 1963 study by the U.S. Securities and Exchange Commission. Academic studies followed, including a pioneering study by one of the present writers of 120 IPOs during the period 1960-1969 which found that the distribution of initial returns was highly skewed, with a positive mean and a median near zero.[1] That study also examined the performance of IPOs during their first five years of "seasoning," concluding that, beyond the first month or two, IPOs earned "normal" market-wide returns on average. More recent work, however, has come to a different conclusion regarding the long-run performance of IPOs, thus challenging the principle of market efficiency.

Using data from the 1970s and 1980s, numerous studies have confirmed the underpricing of new issues. And, in fact, the underpricing phenomenon exists in every nation with a stock market, although the amount of underpricing varies from country to country.[2]

The results of much of our collective research are summarized in two figures. In Figures 1 and 2, we present the monthly average initial returns and the monthly volume of IPOs over the period 1960 through June 1992. The extent of the underpricing and the cycles in volume are clearly demonstrated. Furthermore, the persistence of underpricing has shown no signs of abating: the average initial return for the decade of the 1960s was 21.3%; for the 1970s it was 9.0%; for the 1980s it was 15.2%; and for the early 1990s it has been 10.9%.

The monthly average initial returns were calculated by taking an equally-weighted average of the initial returns on all the offerings in a given calendar month. Because daily stock prices of OTC stocks (where almost all IPOs begin trading) were less available prior to the development of Nasdaq, we chose to use two different methods of calculating the initial returns for the periods 1960-'76 and 1977-92. For the earlier period, the initial returns are computed as the percentage return from the offering price to the bid price at the end of the month following the offering, net of the market return (as measured by the dividend-inclusive S&P 500 return). For the later period, the initial returns are measured as the percentage return from the offering price to the first closing bid price, a period that is normally one day; these returns are not adjusted for market movements.[3]

Table 1 presents the contents of the two figures on a year-by-year basis. The first column presents the number of offerings, the second column the average initial return, and the third column the gross proceeds raised. All of these numbers exclude closed-end funds and real estate investment trust (REIT) offerings.

During the 33-year period, at least 10,626 operating companies have gone public. This number, which greatly exceeds the number of publicly traded firms that have disappeared through bankruptcy, mergers, or takeovers during this period, gives an indication of the dynamic nature of the U.S. economy.

In addition to revealing the extent of IPO underpricing, Figures 1 and 2 also confirm the existence of cycles in both the volume and the average initial returns of IPOs. The periods of high average initial returns are known as "hot issue" markets.[4] The cycles in underpricing allow one to predict next month's average initial return based upon the current month's average with a high degree of accuracy. (In technical terms, the first-order autocorrelation of monthly average initial returns displayed in Figure 1 is 0.66 for the full 33-year period.)

The persistence of *volume* from month to month is even stronger than the persistence in underpricing (the first-order autocorrelation of monthly volume is 0.89). High-volume months are almost always followed by high-volume months.

1. See Roger G. Ibbotson, "Price Performance of Common Stock New Issues," *Journal of Financial Economics* 2 (1975), 235-272.

2. For a discussion of the international evidence, see Tim Loughran, Jay Ritter, and Kristian Rydqvist, "Initial Public Offerings: International Insights," *Pacific-Basin Finance Journal* 2 (March 1994).

3. The conclusions regarding underpricing seem to be fairly insensitive to the length of the initial return interval, and whether (or how) market risk adjustments are made. For evidence on this, see Robert Miller and Frank Reilly, "An Examination of Mispricing, Returns, and Uncertainty for Initial Public Offerings," *Financial Management* (Summer 1987), 33-38 and Chris Barry and Robert Jennings, "The Opening Price Performance of Initial Public Offerings of Common Stock," *Financial Management* (Spring 1993), 54-63.

4. Hot issue markets were first documented in the academic literature by one of the present writers. See Roger G. Ibbotson and Jeffrey F. Jaffe, "Hot Issue Markets," *Journal of Finance* 30 (1975), 1027-1042.

FIGURE 1 ■ AVERAGE INITIAL RETURN BY MONTH

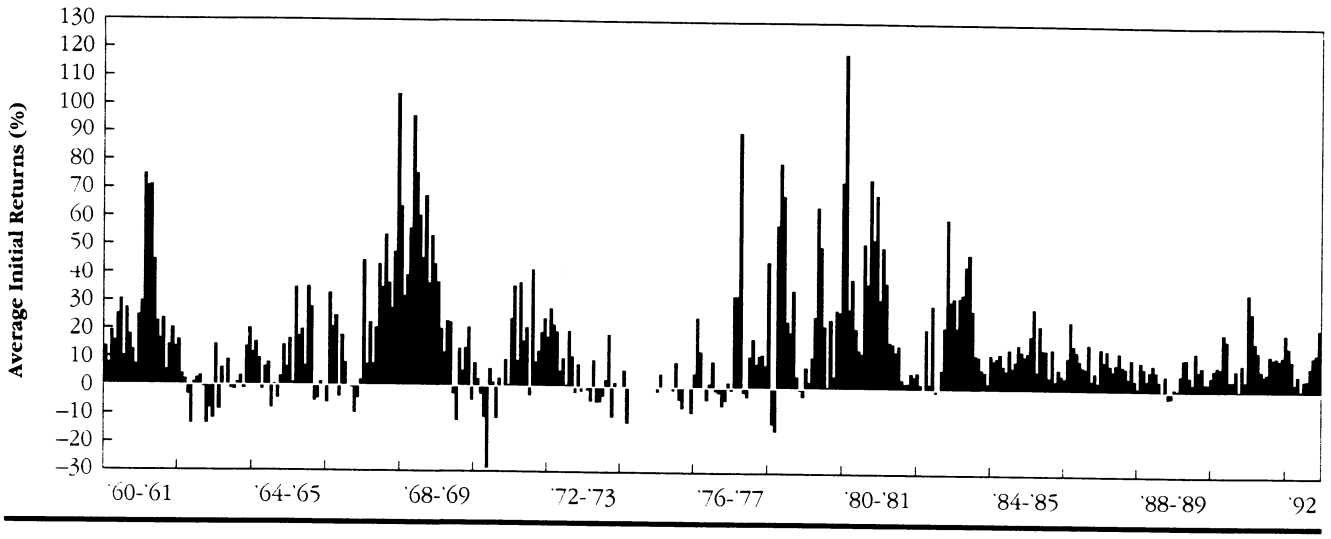
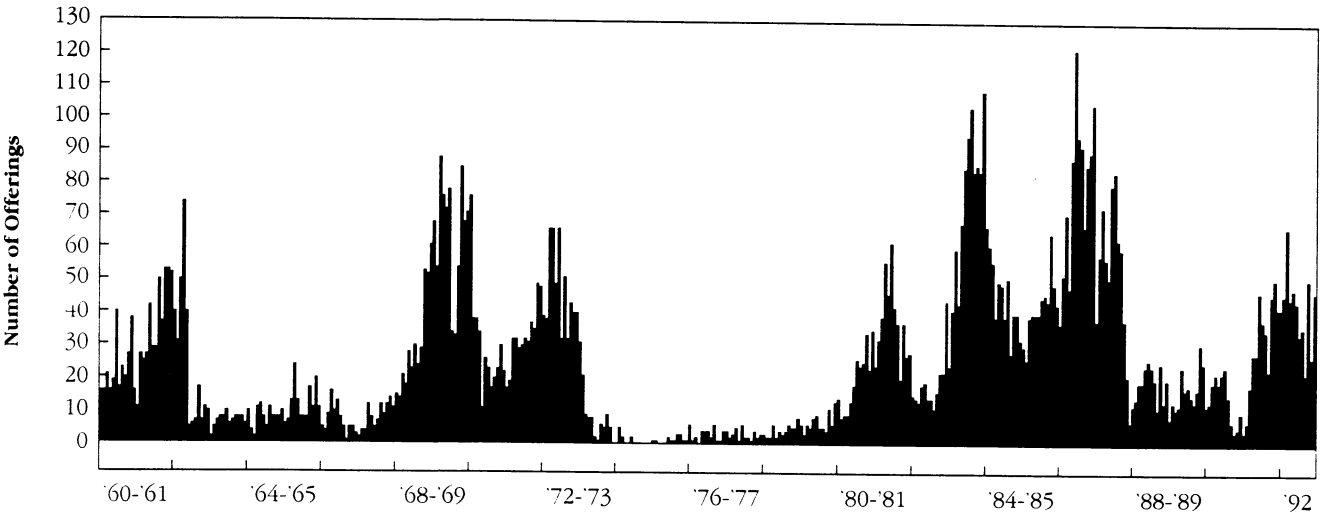


FIGURE 2 ■ NUMBER OF OFFERINGS BY MONTH



with the exceptions being associated with sharp market drops, such as the October 1987 crash.

Smaller offerings, moreover, are underpriced by more, on average, than larger offerings. Indeed, because smaller and lower-priced issues tend to be underpriced by more in the short run, the common practice of computing average initial returns using equal weights on all IPOs tends to overstate the amount of short-run underpricing in the U.S.

Table 2 presents average initial returns for 2439 IPOs in 1975-1984 categorized by their sales in the year before going public. As can be seen, the average initial return is significantly higher for firms with lower sales. Using this same sample, the average initial return on IPOs with an offering price of less than $3.00 is 42.8%, whereas the average initial return on IPOs with an offering price of $3.00 or more is only 8.6%.[5]

5. Similar patterns are reported by Andrew Chalk and John Peavy, "Initial Public Offerings: Daily Returns, Offering Types and the Price Effect," *Financial Analysts Journal* (1987), 65-69. The S.E.C. adopted Rule 15c2-6 on the selling of stocks priced at below $5.00 per share on January 1, 1990 in an effort to crack down on "penny stock" fraud. Since then, relatively few IPOs have been priced below $5.00 per share.

During the period 1960-1992, at least 10,626 operating companies have gone public. This number, which greatly exceeds the number of publicly traded firms that have disappeared through bankruptcy, mergers, or takeovers during this period, gives an indication of the dynamic nature of the U.S. economy.

TABLE 1
NUMBER OF OFFERINGS, AVERAGE INITIAL RETURN, AND GROSS PROCEEDS OF INITIAL PUBLIC OFFERINGS IN 1960-92

Year	Number of Offerings[1]	Average Initial Return,%[2]	Gross Proceeds, $ Millions[3]
1960	269	17.83	553
1961	435	34.11	1,243
1962	298	-1.61	431
1963	83	3.93	246
1964	97	5.32	380
1965	146	12.75	409
1966	85	7.06	275
1967	100	37.67	641
1968	368	55.86	1,205
1969	780	12.53	2,605
1970	358	-0.67	780
1971	391	21.16	1,655
1972	562	7.51	2,724
1973	105	-17.82	330
1974	9	-6.98	51
1975	14	-1.86	264
1976	34	2.90	237
1977	40	21.02	151
1978	42	25.66	247
1979	103	24.61	429
1980	259	49.36	1,404
1981	438	16.76	3,200
1982	198	20.31	1,334
1983	848	20.79	13,168
1984	516	11.52	3,932
1985	507	12.36	10,450
1986	953	9.99	19,260
1987	630	10.39	16,380
1988	435	5.27	5,750
1989	371	6.47	6,068
1990	276	9.47	4,519
1991	367	11.83	16,420
1992	509	10.90	23,990
1960-69	2661	21.25	7,988
1970-79	1658	8.95	6,868
1980-89	5155	15.18	80,946
1990-92	1152	10.85	44,929
TOTAL	10,626	15.26	140,731

1. The number of offerings excludes Regulation A offerings (small issues, raising less than $1.5 million during the 1980s), real estate investment trusts (REITs) and closed-end funds. Data are from Roger G. Ibbotson and Jeffrey F. Jaffe "Hot Issues' Markets," *Journal of Finance* (September 1975) for 1960-70; Jay R. Ritter, "The 'Hot Issues' Market of 1980," *Journal of Business* (April 1984) for 1971-82; *Going Public: The IPO Reporter* for 1983-84; and Investment Dealer's Digest Information Services and Security Data Company for 1985-92. Returns data for 1988-92 exclude best efforts offerings. If these are included, the average initial returns for these years would presumably be higher.

2. Initial returns are computed as the percentage return from the offering price to the end-of-the-calendar month bid price, less the market return, for offerings in 1960-76. For 1977-92, initial returns are computed as the percentage return from the offering price to the end-of-the-first-day bid price, without adjusting for market movements. Data are from Ibbotson and Jaffe (*op. cit.*) for 1960-70, Ritter (*op. cit.*) for 1971-82, and prepared by the authors for 1983-92. Initial returns for 1988-92 were prepared with the assistance of Zhewei Ma.

3. Gross proceeds data come from various issues of the *S.E.C. Monthly Statistical Bulletin* and *Going Public: The IPO Reporter* for 1960-87, and Securities Data Co. for 1988-92. Only the U.S. portion of international equity offerings is included in the gross proceeds figures.

TABLE 2
AVERAGE INITIAL RETURNS CATEGORIZED BY ANNUAL SALES OF ISSUING FIRM

Annual Sales of Issuing Firm[1]	Number of Firms[2]	Average Initial Return,%[3]
0	**386**	**42.9**
1-999,999	678	31.4
1,000,000-4,999,999	**353**	**14.3**
5,000,000-14,999,999	347	10.7
15,000,000-24,999,999	**182**	**6.5**
25,000,000 and Larger	493	5.3
All	2439	20.7

1. Annual sales are measured as the 12-month revenue for the year prior to going public. No adjustments for the effects of inflation have been made.
2. Firms included are those using S-1 or S-18 registration forms, or with Federal Home Loan Bank Board approval, and listed in *Going Public: The IPO Reporter* for 1975-84. Issues not using an investment banker are excluded.
3. Initial returns are calculated as the percentage return from the offering price to the first recorded closing bid price. No adjustments for market movements have been made.

The fact that initial returns tend to be higher and more volatile for smaller issues helps explain one of the patterns in Figure 1—namely, that the variability of the monthly average initial returns is lower after 1984 than before. This is partly a result of the fact that we are using all IPOs before the end of 1984, but only Nasdaq-, Amex-, and NYSE-listed issues thereafter. In other words, the "pink-sheet" stocks most subject to manipulation are included for the period 1960-1984, but not afterwards.[6]

Another reason for the lower variability of monthly average initial returns in the late 1980s and early 1990s is the increasing prevalence of "reverse LBOs" among the IPOs. These are companies that had been taken private in leveraged buyouts during the 1980s. Prior to 1984, less than 1% of the IPOs fit this category, whereas in 1991 approximately 40% of the IPOs were reverse LBOs.

REASONS FOR POSITIVE INITIAL RETURNS

A number of explanations have been advanced for the phenomenon of positive average initial returns, with different theories focusing on various aspects of the relations between investors, issuers, and the investment bankers taking the firms public. In general, these theories are not mutually exclusive. Furthermore, a given reason can be more important for some IPOs than for others.

The Winner's Curse. One important rationale for the underpricing of IPOs is the "winner's curse" explanation.[7] Since a more or less fixed number of shares are sold at a fixed offering price, rationing will result if demand is unexpectedly strong. Rationing in itself does not lead to underpricing, but if some investors are at an informational disadvantage relative to others, some investors will be worse off.

In this model, issuing firms are assumed to be unable to forecast the market price with certainty. For simplicity, all investors are assumed to fall into two categories: completely informed, and completely uninformed, with respect to knowledge of the future market price of the shares being sold. In the model, informed investors will attempt to buy shares only when an issue is underpriced. Uninformed investors, on the other hand, do not know which issues will be underpriced or overpriced, and so will be allocated only a fraction of the most desirable new issues, while they are allocated *all* of the least desirable new issues.

Uninformed investors thus face a winner's curse: if they get all of the shares they demand, it is because the informed investors don't want the shares. Faced with this "adverse selection" problem, uninformed investors will only submit purchase orders if IPOs are underpriced sufficiently, on average, to compensate them for the bias in the allocation of new issues.

Numerous studies have attempted to test the winner's curse model, both for the U.S. and other countries. A cross-sectional implication of the model, developed by one of the present writers, is that riskier issues should have greater underpricing on

6. Partly this is because before the development of Nasdaq in 1971, all over-the-counter stocks were pink-sheet stocks. By the early 1980s, only the smallest capitalization stocks were still pink-sheet stocks.

7. As formulated by Kevin Rock in "Why New Issues Are Underpriced," *Journal of Financial Economics* 15 (1986), 187-212.

The average initial return on IPOs with an offering price of less than $3.00 is +2.8%, whereas the average initial return on IPOs with an offering price of $3.00 or more is only 8.6%.

average.[8] While the evidence is consistent with this prediction, other explanations of the underpricing phenomenon also make this prediction.

Dynamic Information Acquisition. Another model holds that investment bankers underprice IPOs to induce regular investors to reveal information during the pre-selling period that can be used to help in pricing the issue.[9] In order to get regular investors to reveal their own valuations, the investment banker compensates those investors in the form of underpricing. The process works like this: to elicit truthful revelation for a given IPO, the investment banker must underprice issues for which favorable information is revealed by more than those for which unfavorable information is revealed.

This "dynamic" information model leads to a prediction that there will only be a partial adjustment of the offer price from that contained in the preliminary prospectus to that in the final prospectus. In other words, those IPOs for which the offer price is revised upwards will be *more* underpriced than those for which the offer price is revised downwards.

An example illustrates the point: In the March 1986 offering of Microsoft, the preliminary prospectus indicated an offering price range of $16-$19 per share. The actual offering price was $21 per share. The stock closed at $27.75 on its first day of trading, producing an initial return of 32%.[10]

Information Cascades. In this model, potential investors pay attention to not only their own information about a new issue, but also to whether other investors are purchasing.[11] If an investor sees that no one else wants to buy, he may decide not to buy even when he has favorable information. To prevent this from happening, an issuer may want to underprice an issue to induce the first few potential investors to buy, and thereby set off a cascade in which all subsequent investors want to buy irrespective of their private information.

Reducing Legal Liability. The Securities Act of 1933 makes all participants in the offer who sign the prospectus liable for any material omissions. One way of reducing the frequency and severity of future lawsuits is to underprice. One study tested the lawsuit avoidance hypothesis by examining 93 IPOs from 1969-90 that were subsequently involved in lawsuits.[12] It found that these IPOs had average initial returns similar to control firms that did not get sued.

However, another study of IPOs of computer firms in 1983 found that every firm in which the total decline in the market value of the offering was over $20 million during the subsequent several years was sued. Further, almost all of the suits were settled, independent of the merits of the individual case, for approximately 25% of the decline in market value.[13] As this study pointed out, the cost to law firms of bringing suits deters lawsuits following small offerings, so that legal liability considerations would imply less underpricing of small issues (which, of course, is contrary to the pattern actually observed).

On balance, then, the evidence suggests that legal liability considerations are at most a minor reason for the underpricing of IPOs.

Enhancing Banker Relations with Investors. Underpriced new issues are said to "leave a good taste" with investors, allowing companies to sell future, seasoned offerings at a higher price than would otherwise be the case. This reputation argument has been formalized in a number of signalling models.[14] In these models, issuing firms have private information about whether they have high or low values. They follow a dynamic issue strategy in which the IPO will be followed by a seasoned offering. There is some probability that investors will become aware of the true value before the seasoned offering, in which case any actions undertaken at the time of the IPO will have little consequence for the seasoned offering.

Another related explanation for the underpricing phenomenon focuses on information asymmetries between issuing firms and their investment bankers. This theory hypothesizes that

---

8. See Randolph P. Beatty and Jay R. Ritter, "Investment Banking, Reputation, and the Underpricing of Initial Public Offerings," *Journal of Financial Economics* 15 (1986), 213-232.

9. This argument is developed in Lawrence Benveniste and Paul Spindt, "How Investment Bankers Determine the Offer Price and Allocation of New Issues," *Journal of Financial Economics* 24 (1989), 343-361.

10. For an informative account of the Microsoft offering, see Bro Uttal, "Inside the Deal that Made Bill Gates $350,000,000," *Fortune* 114 (July 21, 1986), pp. 23-33. This article was written back in the days before Gates became really rich, as Microsoft stock went up 2000% in the six years after going public. The stock has split numerous times. For more general evidence on the partial adjustment phenomenon, see Kathleen Weiss Hanley, "Underpricing of Initial Public Offerings and the Partial Adjustment Phenomenon," *Journal of Financial Economics* (October 1993), 231-250.

11. See Ivo Welch, "Sequential Sales, Learning, and Cascades," *Journal of Finance* 47 (June 1992), 695-732.

12. See Philip Drake and Michael Vetsuypens, "IPO Underpricing and Insurance Against Legal Liability," *Financial Management* (Spring 1993), 64-73.

13. See Janet Cooper Alexander, "Do the Merits Matter? A Study of Settlements in Securities Class Actions," *Stanford Law Review* 43 (1991), 497-598.

14. See, for example, Franklin Allen and Gerald Faulhaber, "Signalling by Underpricing in the IPO Market," *Journal of Financial Economics* 23 (1989), 303-323.

investment bankers take advantage of their superior knowledge of market conditions to underprice offerings, which facilitates their marketing and allows them to ingratiate themselves with buy-side clients.[15] While there is undoubtedly some truth to this argument, especially in the case of less sophisticated issuers, another study finds that when investment banking firms go public, they tend to underprice themselves by as much as other IPOs of similar size.[16]

Regulatory Constraints. Underpricing in IPOs may be caused by regulatory requirements that offering prices be set lower than they otherwise would be. This argument has limited relevance for the U.S., where the SEC is concerned with full disclosure rather than "fairness." In some countries, however, regulators require that offering prices be based upon book values. For companies with valuable growth opportunities that are not reflected in their book values, this results in underpricing.

Political Motives. Issuers as well as investment bankers may be able to use allocations of underpriced IPO shares to pursue political objectives. In Japan, the Recruit Cosmos IPO led to the resignation of Prime Minister Takeshita in April 1989. The Recruit company sold off its real estate subsidiary, Cosmos, in an initial public offering that was severely, and intentionally, underpriced. Many of the shares were allocated to politicians. When the details came to light, several prominent politicians resigned, for the scheme was only a tiny step away from handing over envelopes filled with cash. The scandal also led to changes in the Japanese regulations for selling IPOs, with much less underpricing in 1989 than previously.

Such practices, moreover, have not been unknown in the U.S. The cover story of the April 4, 1994 issue of *Business Week* was titled, "Beware the IPO Market," and it describes some unsavory allocation practices in this country.

EXPLANATIONS OF HOT ISSUE MARKETS

Rational explanations for the existence of hot issue markets are more difficult to come by.

Changes in Firm Risk. One of the present writers has hypothesized that, since riskier issues tend to be underpriced to a greater extent than their less risky counterparts, "changing risk composition" might be able to account for the dramatic swings in average initial returns.[17] If there are some periods in which the firms going public are riskier than in other periods, the periods with the riskier firms will have higher average initial returns. But although there is some evidence that hot issue periods are characterized by riskier issues, the amplitude of the cycles in average initial returns is far larger than can be accounted for by differences in issuer risk.

Positive Feedback or "Momentum" Strategies. A second possible explanation for the existence of hot issue markets is that some investors follow "positive feedback" strategies, in which they assume that there is positive autocorrelation in the initial returns on IPOs. These investors are willing to bid up the price of an issue once it starts trading if other recent issues have risen in price. If enough investors follow such a strategy, they may end up causing the expected positive autocorrelation of initial returns in a kind of self-fulfilling prophecy. The difficulty of taking a short position in an IPO immediately after the offering may also prevent other investors from making money at the expense of these positive feedback traders.

Windows of Opportunity. Finally, hot issue market cycles may exist because there are periods when IPOs can be sold at relatively high price-earnings and market-to-book ratios, or at high levels relative to other measures of value. This induces a high volume of new issues, and a relative willingness on the part of issuers to sell the offerings below the aftermarket price.

If there are periods when investors are especially optimistic about the growth potential of companies going public, the large cycles in volume may represent a response by firms attempting to "time" their IPOs to take advantage of these swings in investor sentiment. Of course, due to normal business cycle activity, one would expect to see some variation through time in the volume of IPOs. But the large amplitude of the cycles displayed earlier in Figure 2 seems difficult to explain as normal business cycle activity. If companies are taking advantage of

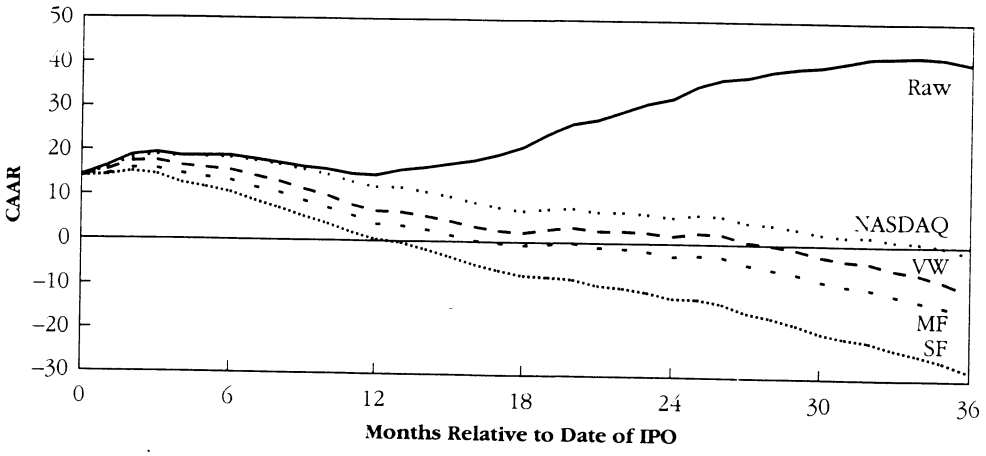
15. See David Baron and Bengt Holmström, "The Investment Banking Contract for New Issues Under Asymmetric Information: Delegation and the Incentive Problem," *Journal of Finance* 35 (1980), 1115-1138.

16. See Chris Muscarella and Michael Vetsuypens, "A Simple Test of Baron's Model of IPO Underpricing," *Journal of Financial Economics* 24 (1989), 125-135.

17. See Jay R. Ritter, "The 'Hot Issue' Market of 1980," *Journal of Business* 57 (April 1984), 215-240.

The long-run underperformance of IPOs is much more pronounced for young companies than for more established firms. This is consistent with the patterns in initial returns and hot issue markets, where the smaller offerings by newer, more speculative firms display the highest initial returns and the greatest variation over time.

FIGURE 3
CUMULATIVE AVERAGE ADJUSTED RETURNS FOR AN EQUALLY-WEIGHTED PORTFOLIO OF 1,526 INITIAL PUBLIC OFFERINGS IN 1975-1984, WITH MONTHLY REBALANCING*



*Five CAR series are plotted for the 36 months after the IPO date: no adjustment (*Raw*); CRSP value-weighted NASDAQ index adjustment (*NASDAQ*); CRSP value-weighted Amex-NYSE index adjustment (*VW*); matching firm adjustment (*MF*); and lowest decile of NYSE market capitalization index adjustment (*SF*). Month 0 is the initial return interval.

misvaluations by investors, then we would expect to see poor subsequent performance following high volume periods. In fact, this is what happens, as we discuss in the next section.

Hot issue markets also exist in other countries as well as the U.S. For example, there was a hot issue market in the United Kingdom between the "Big Bang" (the end of fixed commission rates) in October 1986 and the crash a year later. In South Korea, there was a hot issue market in 1988 that coincided with a major bull market.

LONG-RUN PERFORMANCE

The third anomaly associated with IPOs is the poor stock price performance of IPOs in the long run. One of us has documented that for IPOs going public during the period 1975-1984, the total return from the end of the first day of trading to three years later was 34.5%.[18] For each of these companies, however, a similar firm on the NYSE produced a total return of 61.9%, due largely to the bull market of the 1980s. Thus, IPOs underperformed. These findings are illustrated in Figure 3.

While IPOs underperform as a group, the underperformance is much more pronounced for young companies than for more established firms. This is consistent with the patterns in initial returns and hot issue markets, where the smaller offerings by newer, more speculative firms display the highest initial returns and the greatest variation over time. By contrast, the market's valuation of larger issues by older, more established companies is much less subject to these swings, and there is little evidence of long-run underperformance among these firms (which include a significant number of reverse LBOs) when going public.

An ongoing study involving one of the present writers is finding that the underperformance patterns are pervasive for firms going public throughout the 1970-1990 period.[19] Furthermore, this underperformance lasts for a full five years after the offering.[20] There is also evidence that the earnings per share of companies going public typically grows rapidly in the years prior to going public, but then actually declines in the first few years after the IPO.[21]

This long-run underperformance was concentrated among firms that went public in the heavy-volume years of the early 1980s, and for younger firms. By contrast, there was no evidence of long-run underperformance by more established firms going public, and by those firms that went public in the light-volume years of the mid- and late-1970s. Other studies find similar patterns: the companies going

18. See Jay R. Ritter, "The Long-Run Performance of Initial Public Offerings," *Journal of Finance* 46 (March 1991), 3-27.

19. See the unpublished University of Illinois working paper "The New Issues Puzzle," by Tim Loughran and Jay R. Ritter.

20. See Tim Loughran, "NYSE vs Nasdaq Returns: Market Microstructure or the Poor Performance of IPOs?" *Journal of Financial Economics* 33 (1993), 241-260.

21. See Bharat Jain and Omesh Kini, "The Post-Issue Operating Performance of IPOs," forthcoming in the *Journal of Finance*.

public in heavy-volume years on average underperform, but firms going public during light-volume years do not.[22]

The finding that long-run performance is negatively related to new-issue volume is consistent with the hypothesis that firms are taking advantage of windows of opportunity during which investors are willing to overpay for IPOs. To the extent this is correct, IPOs may not be underpriced after all. Instead, the initial aftermarket may actually be overpriced, particularly during hot-issue periods. If offerings are indeed sometimes overpriced (relative to long-run value), this would explain the clusterings of high initial returns and the associated heavy volume of new issues.

Two theories have been proposed to explain the long-run underperformance of IPOs.

Excessive Optimism. One explanation for the poor long-run performance of IPOs is that investors who are most optimistic about an IPO will be the buyers.[23] If there is a great deal of uncertainty about the value of an IPO, the valuations of optimistic investors may be much higher than those of pessimistic investors. As time goes on and more information about future performance becomes available, the divergence of opinion between optimistic and pessimistic investors will narrow, and consequently, the market price will drop.

Impresarios. A second explanation is that the market for IPOs is subject to fads. IPOs are underpriced by investment bankers to create the appearance of excess demand, just as the promoter of a rock concert attempts to make it an "event."[24] This "investment banker as impressario" hypothesis predicts that the long-run performance of IPOs should be negatively related to the short-run underpricing. There is some evidence of this relation among the 1975-1984 IPOs.

The empirical evidence is consistent with both of the above scenarios. Furthermore, there is survey evidence suggesting that many investors are periodically over-optimistic about the earnings potential of young growth companies. One survey of investors in IPOs found that only 26% of the respondents did any fundamental analysis of the relation between the offer price and the firm's underlying value.[25]

SUMMARY

The pricing of young growth companies going public is difficult, and there is evidence that the market fails to get it right. Three anomalies have been documented for IPOs: (1) short-run underpricing, (2) cycles in volume and the extent of underpricing, and (3) long-run underperformance. These anomalies are a challenge to the efficient markets hypothesis, and have generated a large literature. The poor long-run performance of IPOs indicates that, in spite of the short-run underpricing phenomenon, the cost of equity capital is not excessively high for young growth firms. More troublesome, however, is that the terms on which equity capital can be raised appear to vary substantially over time, so that the ability to finance promising investments is subject to the whims of the market, as well as the fundamentals of the company.

---

22. *Forbes* magazine has run a number of articles, starting with its December 5, 1985 issue, documenting the long-run underperformance of IPOs. See Warren Midgett and Scott DeCarlo, "New Issue Roulette" in the June 22, 1992 *Forbes*. See also Reena Aggarwal and Pietra Rivoli, "Fads in the Initial Public Offering Market?" *Financial Management* 19 (Winter 1990), 45-57.

23. See Edward Miller, "Risk, Uncertainty, and Divergence of Opinion," *Journal of Finance* 32 (September 1977), 1151-1168.

24. See Robert Shiller, "Speculative Prices and Popular Models," *Journal of Economic Perspectives* 4 (1990), 55-65.

25. See Shiller, ibid.

■ ROGER IBBOTSON

is Professor in the Practice of Finance at the Yale School of Management, and President of Ibbotson Associates, a consulting firm based in Chicago. He is on the Advisory Board of this journal, and is an Associate Editor of *Financial Analysts Journal*.

■ JODY SINDELAR

is Associate Professor of Economics at Yale's School of Public Health and has an appointment in Yale's Institute for Social and Policy Studies.

■ JAY RITTER

is the Fred S. Bailey Memorial Professor of Finance at the University of Illinois at Urbana-Champaign. He is an Associate Editor of the *Journal of Finance* and the *Journal of Financial Economics*, and a director of the American Finance Association.