

IN ECONOMICS AND FINANCE

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Pre-IPO Financial Performance and Aftermarket Survival

Stavros Peristiani and Gijoon Hong

Many commentators have portrayed the tech boom of the late 1990s as an era of unprecedented deterioration in the quality of firms undertaking initial public offerings. But as far back as the early 1980s, firms seeking to go public were displaying signs of financial weakness, and the failure rate of issuers was on the rise. An analysis of the likelihood of failure among IPO firms in 1980-2000 suggests that pre-issue profitability is a good predictor of aftermarket survival.

ince 1980, more than nine thousand privately held corporations have participated in initial public offerings (IPOs). By making their stock available to the public, these companies have succeeded in raising a total of \$450 billion. As the numbers suggest, firms look to IPOs as a key source of capital—capital that can be used to expand or diversify operations, build new facilities, and develop new technologies and products. For investors, the IPO market has other attractions: Initial public offerings, though risky, present an opportunity to invest in forward-looking firms with the potential for high growth.

During the last few years, however, the boom-and-bust fortunes of the technology IPO market have caused investor sentiment toward IPOs to turn sharply negative. At the height of the dot-com craze in 1999-2000, the average first-day return on IPOs shot up to a staggering 65 percent. The market euphoria was short-lived, however, as investors suffered huge losses with the decline or failure of the high-tech companies. In reaction to these developments, the flow of new IPO issues slowed dramatically in

2002 and the first half of 2003, and the number of withdrawn offerings soared. Although issuance picked up in the latter half of 2003, IPO activity remains well below the high levels reached in earlier years.

Many industry analysts have attributed the technology IPO debacle of 2001-03 to the deteriorating quality of businesses that decided to "go public." In this view, enormous numbers of speculative firms entered the public markets in the late 1990s with poor business plans and little or no foreseeable earnings.²

In this edition of *Current Issues*, we take a longer view of the IPO market by evaluating the fundamentals of firms that went public over the two-decade period from 1980 to 2000. Our analysis reveals a striking decline in the pre-IPO financial condition of issuers that was discernible as far back as the early 1980s. Consistent with the deteriorating financial performance of the IPO firms, we also document a significant rise during this period in the failure rate of issuers after the offering. Other factors being equal, firms with negative pre-IPO earnings were three times more likely to be dropped from an exchange than were profitable

issuing companies. Thus, our look at the IPO experience over an extended period suggests that weak financial performance by private firms seeking to go public may be a very telling signal of aftermarket failure.

Overview of IPO Activity, 1980-2000

IPO activity increased markedly in the 1990s from its levels in the preceding decade. A brief look at issuance for the full sample of IPO companies—excluding specialized fund issues such as closed-end funds, foreign issues traded as American depository receipts, real estate investment trusts, and unit trusts—shows that the aggregate nominal value of IPO proceeds was considerably higher in the 1990s than in the 1980s, and especially high during the Internet boom period of 1999-2000 (Table 1). The upsurge in the volume of gross proceeds in this decade was also significant in real, or inflation-adjusted, terms (for instance, when adjusted by the

Table 1 IPO Issuance, 1980-2002

Year Number of IPOs Total IPO Issuance (Millions of Dollars) Percentage Total Mark 1980 147 1,315 0.077 1981 347 3,055 0.212 1982 121 1,331 0.080 1983 675 12,192 0.636 1984 344 3,124 0.172 1985 329 6,255 0.276 1986 691 17,198 0.675 1987 507 13,012 0.510 1988 215 4,445 0.160 1989 205 5,509 0.164	
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1989 205 5,509 0.164	
1980-89 3,581 67,436 0.296	
1990 171 4,389 0.145	
1991 361 15,494 0.382	
1992 498 21,290 0.478	
1993 632 29,645 0.576	
1994 532 17,277 0.339	
1995 545 26,329 0.383	
1996 817 41,606 0.493	
1997 564 32,413 0.295	
1998 347 32,295 0.239	
1999 496 54,272 0.310	
1990-99 4,963 275,010 0.364	
2000 374 51,701 0.325	
2001 91 32,045 0.226	
2002 86 23,202 0.206	
1980-2002 9,095 449,394 0.320	

Source: Thomson Financial Securities Data Corporation (SDC).

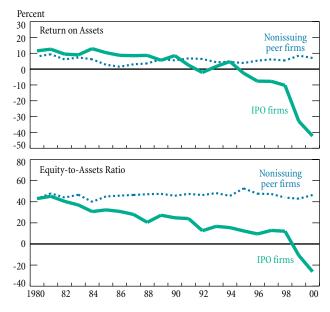
Note: The IPO sample excludes closed-end funds, American depository receipts, real estate investment trusts, and unit trusts.

consumer price index deflator). As a percentage of total stock market capitalization, the volume of IPO proceeds also grew, albeit more slowly. The amount of funds raised by issuing companies during the 1980s and 1990s averaged 0.296 percent and 0.364 percent, respectively, of the total stock market capitalization.

The Financial Condition of Offering Firms Before They Go Public

While the statistics on issuance attest to the rising popularity of IPOs over the last two decades, they tell us very little about the quality of companies seeking equity financing. To analyze the financial soundness of issuing companies before the offering, we employ two widely used accounting measures. First, we estimate firm profitability based on the return on assets, defined as net income after taxes divided by total assets.³ The top panel of Chart 1 plots this profitability measure from 1980 to 2000.4 Offering firms (solid line) show a marked deterioration in profitability in the 1990s. By contrast, a control sample of nonissuing firms (dashed line), comparable in size and valuation to the issuing firms,⁵ exhibit a much more stable pattern of profitability during the twenty-year period. The consistently positive performance of these "peer" firms over these years suggests that the dramatic deterioration in the financial strength of IPO firms cannot be attributed to weaker or changing economic conditions.

Chart 1 Pre-Issue Financial Performance of IPO Firms, 1980-2000



Sources: Standard and Poor's Compustat database; Thomson Financial Securities Data Corporation (SDC).

Our second important indicator of financial soundness is capitalization, or net worth, defined as total assets minus total liabilities. The bottom panel of Chart 1 traces the equity-to-assets ratios of issuers and their nonissuing peers from 1980 to 2000.⁶ Consistent with our previous finding, the chart shows that the financial net worth of issuing companies declined dramatically, while the net worth of nonissuing firms maintained a steady level. Moreover, the gradual but widening gap in performance between offering companies and their peers appears to have originated as far back as the early 1980s.

Accounting for the Decline

One possible explanation for the deteriorating financial performance of issuers from 1980 to 2000 is the apparent structural change in the character of the firms going public. The proliferation of younger and more speculative issuers in the 1990s may in some measure be responsible for the financial underperformance of IPO firms. The number of high-growth technology and Internet offerings exploded in the 1990s as breakthroughs in personal computing, software development, and communications and networking spurred the formation of new, highly innovative companies. The emergence of these speculative firms may have weighed down the financial performance of issuers as a group. Indeed, a look at the financial strength of technology and Internet IPOs over the entire period reveals an unambiguous pattern of deterioration (Table 2, panel A). During the 1980-84 period, these firms earned a healthy \$0.77 per share. In the 1995-2000 period, however, they lost \$1.17 per share on average. Within this group, the Internet firms

performed particularly poorly, averaging a loss of \$3 per share before going public.⁷

While the financial weakness of the tech firms probably accounts for much of the pre-issue decline of IPO firms, our findings suggest that nontechnology firms—"other" in panel A of Table 2—lost significant strength as well. In fact, the profitability and net worth measures for all firms began to drop in the late 1980s, long before the onset of the high-tech boom.

A look at the exchanges on which the IPO firms' securities were traded also sheds some light on the firms' decline (Table 2, panel B). Roughly 73 percent of the offering firms were listed on the NASDAQ (National Association of Securities Dealers Automated Quotation) market. Small firms prefer NASDAQ because of lower minimum listing requirements, lower initial and annual fees, and other institutional features. Moreover, throughout the 1980s and 1990s, many technology IPO companies were drawn to NASDAQ because of its unique structure of market makers. The belief was that market makers expert in the technology sector could best represent new tech and Internet issuers, increasing the visibility of these companies and providing liquidity for their stock (Corwin and Harris 2001).

The emergence of NASDAQ in the 1970s clearly broadened the pool of companies eligible to issue equity to include many more small and speculative new firms. Because of the greater riskiness of these firms, the deterioration in financial performance in the 1980-2000 period was especially sharp for firms listed on NASDAQ. Nevertheless, it is significant that firms listed on the New York Stock Exchange (NYSE)

Table 2
Pre-IPO Financial Performance, 1980-2000

A. Tech-Internet Firm		B. Exchange			C. Underwriter		D. Venture-Capital-Backed		
Period	Yes	Other	NYSE	AMEX	NASDAQ	Top-Tier	Other	Yes	No
			Pr	ofitability: Earr	nings per Share (Do	llars)			
1980-84	0.77	1.29	1.83	1.23	1.11	1.37	1.09	0.78	1.42
1985-89	0.59	1.01	1.43	1.17	0.84	1.17	0.81	0.72	1.08
1990-94	-0.01	0.32	0.70	-0.10	0.20	0.45	0.20	-0.12	0.59
1995-2000	-1.17	-0.45	0.27	-0.01	-1.08	-1.21	-0.57	-1.94	-0.04
			Net Wor	th: Common Ec	quity-to-Assets Rati	io (Percent)			
1980-84	38.35	37.81	37.64	38.70	37.87	37.48	37.53	40.62	36.50
1985-89	39.29	27.75	28.08	27.21	29.30	29.24	28.62	27.12	29.72
1990-94	17.46	17.05	20.74	22.29	15.84	17.44	16.90	9.14	22.87
1995-2000	-10.65	9.28	24.58	19.66	-1.74	1.37	4.00	18.88	18.73

Source: Thomson Financial Securities Data Corporation (SDC).

Note: The group of top-tier underwriters is defined in note 8.

also suffered a significant decline in profitability during this two-decade period, with earnings per share falling from \$1.83 in the early 1980s to \$0.27 in the late 1990s.

We note, too, that the deterioration in quality has been similar in firms whose securities have been brought to market by large, or top-tier, underwriters and firms whose securities have been brought to market by small underwriters (Table 2, panel C).⁸ Before the 1980s, top-tier underwriters rarely advised small, unprofitable firms. However, as smaller firms began to dominate the pool of eligible issuers, large underwriters had to adapt their standards to accommodate them.

Venture capital investors also had to choose from among riskier start-up companies as the period progressed. Nevertheless, IPO firms backed by venture capital have always been more speculative than more established firms that generally did not need such funding (Table 2, panel D). After all, the role of venture capitalists is to invest in projects whose potential for high growth is offset by high risk.

The Aftermarket Survival of IPO Firms

We have documented a striking decline in the pre-issue financial condition of firms that undertook an IPO in the 1980-2000 period. How did these firms fare after going public?

In theory, of course, a number of outcomes are possible. Once a firm has made its stock available to the public, it may continue operating as a viable concern, trading on one of the major stock exchanges. It may also be acquired by another firm, choose to go private again, or liquidate. In the worst-

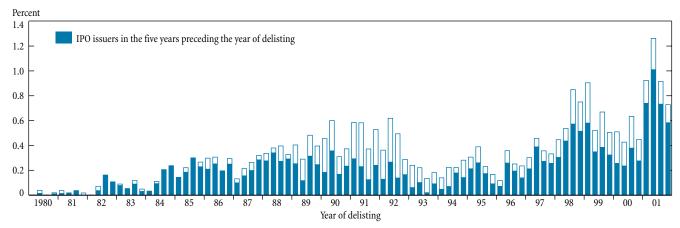
case scenario, a company may be delisted—that is, dropped from the exchange on which its securities are traded—because of poor performance.⁹

We track the percentage of public firms that experienced a negative-performance delisting during 1980-2001 (Chart 2). The bars in the chart capture the failure rate among all firms that went public. The lower portion of each bar (shown in blue) represents the failure rate among the subset of firms that went public during the five years preceding the date of delisting shown at the bottom of the bar.

As the chart indicates, delistings climbed gradually over the sample period, reaching a high in 2001 when an unprecedented 600 IPO firms—accounting for 3.8 percent of all publicly traded stocks—were dropped by the major stock exchanges. Driving this result were delistings by firms that had gone public in the five preceding years: indeed, this group of relatively recent issuers (blue portion of the bars) accounted for an average 68 percent of the delistings. ¹⁰

In addition to highlighting both the broad rise in IPO failures and the tendency of IPO delistings to occur within a few years of issuance, the chart underscores the cyclical behavior of the firm failures. The surge in IPO failures during the recessions of 1990-91 and 2001 indicates that unfavorable macroeconomic conditions can contribute to the failure of IPO firms. In particular, an unanticipated economic slowdown can be detrimental to companies with weak financial balance sheets. Similarly, industry-specific factors can help bring about the failure of firms. For example, increasing competition in an industry can lead to the loss of important

Chart 2 Delisted IPO Firms as a Percentage of All Public Firms, 1980-2001 Quarterly Data



Source: Center for Research in Security Prices.

customers and a drop in market share. Thus, IPO firms, like more established companies, need to avoid poor managerial decisions and other strategic missteps if they are to survive and prosper.

How Well Does Pre-IPO Performance Predict Aftermarket Survival?

We have seen that the sharp decline in pre-IPO fundamentals over the 1980-2000 period coincided broadly with a rise in the incidence of delisting. Together, these developments suggest that for many firms, the seeds of failure may have been planted before the decision to go public was made. Specifically, it appears likely that the financial weakness of issuing firms may have hampered their ability to compete and survive in the public market.

In this section, we test this hypothesis by investigating whether the financial condition of IPO firms before the offering can predict their ultimate success and survival in the public market. To some, this relationship is a given—bad firms fail after all. To others, especially investors who bought dot-com shares in the secondary market at exorbitant prices, it may be an unpleasant reminder that they may have overlooked many conspicuous warning signals. Often these symptoms of financial weakness are discernible from IPO prospectuses that report a company's current financial state as well as its business plan and revenue potential.

To estimate the relationship between a firm's pre-IPO performance and its ability to survive in the aftermarket, we employ a cross-sectional hazard regression model. To be sure, a firm's survival is most accurately ascertained from its post-issue financial condition. Our goal here, however, is to determine if one can predict the long-run survival of an issuer by using only that information that would be available to an investor prior to the offering. ¹¹

In the cross-sectional hazard regression, the dependent variable is the conditional probability that the IPO firm will fail (that is, delist) given that it has not failed until that point in time. The explanatory variable is a measure of the preissue financial condition of the IPO firm. In line with our earlier analysis, we use the firm's return on assets to gauge its financial strength. The regression also includes exchange dummy indicators (NYSE, NASDAQ, or AMEX) to control for the impact of heterogeneous listing requirements.

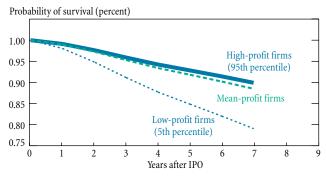
Our regression analysis reveals a strong and statistically significant negative relationship between the probability of delisting and a firm's pre-issue return on assets. To illustrate this relationship, we use a simple graphical approach that maps the survival of IPO firms for different levels of pre-issue profitability (Chart 3). The middle curve in the chart represents the experience of the average-profit company, one with a slightly negative return on assets. The top and bottom curves plot the survival of issuers ranked at the 95th and 5th percentiles of profitability, respectively. The considerable disparity in performance between the high-profit and low-profit groups (about 13 percentage points after seven years) indicates that pre-IPO profitability is, by itself, a very strong indicator of the ability of firms to operate successfully after the offering.

We then repeat the analysis using alternative explanatory variables—first, the age of the company at the time of the offering and, second, the extent of insider ownership. Like firms' return on assets, these variables are discernible from the IPO prospectus. And although they are firm or deal characteristics rather than measures of pre-IPO financial performance, both are likely to have some power to predict aftermarket survival.

Company age, measured by subtracting the year the company was founded from the year it went public, appears to be a good proxy for financial riskiness. Ritter (1991) shows that younger issuing companies underperform their more established peers. The mean age of new listed companies remained fairly stable until the late 1990s, hovering around seven years. With the dot-com explosion of the late 1990s, however, the average age of an issuing firm dropped to four years. The failure rate among these speculative companies that rushed to go public appears to have been very high. Indeed, our calculations confirm that firm age is a fairly good predictor of aftermarket survival (Table 3, panel B).

As for insider ownership, a number of academic studies point to a relationship between the structure of an IPO deal and the post-issue performance of the firm. In their seminal paper, Jensen and Meckling (1976) argue that in firms where

Chart 3 Survival of IPO Firms by Level of Pre-Issue Profitability, 1980-2000



Source: Authors' calculations.

Table 3
Firm Characteristics and the Likelihood of Survival, 1980-2000

	A. Capitalization			B. Age at IPO			C. Level of Insider Ownership		
Years after IPO	Average Firm	95 th Percentile	5 th Percentile	Average Firm	95 th Percentile	5 th Percentile	Average Firm	95 th Percentile	5 th Percentile
1	0.974	0.978	0.965	0.973	0.980	0.969	0.980	0.982	0.978
2	0.935	0.944	0.913	0.934	0.950	0.924	0.945	0.950	0.938
3	0.890	0.905	0.853	0.888	0.916	0.873	0.905	0.914	0.893
4	0.848	0.869	0.800	0.843	0.880	0.822	0.862	0.874	0.845
5	0.817	0.841	0.759	0.807	0.853	0.782	0.833	0.848	0.814
6	0.780	0.808	0.713	0.767	0.821	0.738	0.796	0.814	0.773
7	0.744	0.776	0.669	0.733	0.793	0.699	0.765	0.785	0.739

Source: Authors' calculations.

Notes: The likelihood of survival is the probability that the IPO firm will still be trading on a major stock exchange after n years (n = 1,...,7). A firm's capitalization is calculated as net worth divided by total assets. The age at IPO is calculated as the difference in years between the firm's establishment date and the date of the offering. The level of insider ownership is the percentage of shares retained by firm owners and managers after the offering.

insiders—owners and managers—hold a relatively small fraction of the company stock, the interests of management will not be aligned with those of the shareholders; thus, managers are less likely to undertake projects that would enhance the value of the firm and more likely to seek rewards in the form of perks and other nonpecuniary benefits. Jain and Kini (1994) find that IPO firms whose management retains a high level of ownership at the time of transition from private to public enterprise exhibit stronger operating performance after the offering. Consistent with the findings of these studies, our analysis shows that a high level of stock retention by insiders increases an IPO firm's survival rate in the public market (Table 3, panel C).

Firm and deal characteristics clearly can shed light on the likelihood of an IPO firm's survival. Nevertheless, pre-issue profitability and similar measures of performance emerge in our analysis as the best predictors by far. A simple way to illustrate the importance of pre-issue performance is to compute the hazard ratio, which compares the probability of delisting for unprofitable and profitable issuers. The hazard ratio in the 1990s is roughly 3, meaning that, with other factors held constant, investors who bet on more speculative, money-losing IPO firms faced a risk of delisting that was roughly three times greater than that faced by investors in profitable firms.

Conclusion

Stock market participants are still recovering from the hightech collapse that erased several trillions of dollars of market capitalization and brought massive layoffs and record numbers of business failures to the technology sector. It is hardly surprising that the IPO process that facilitated most of the speculative issues has come under intense scrutiny. In this article, we document a gradual but significant deterioration in pre-IPO financial performance over the 1980-2000 period and a corresponding rise in the failure rate of firms following their entry in the public market. Using a hazard regression model, we show that pre-IPO profitability and related measures are very good predictors of a firm's ability to survive in the aftermarket.

Our analysis serves as a reminder that a viable and well-functioning IPO market must on the whole be based on companies with sound fundamentals and strong business plans. It is reasonable, of course, for investors to embrace a wide range of IPOs across the whole spectrum of risk. But in the 1990s, the majority of companies that went public were unprofitable, with the result that investing in speculative firms became the rule rather than the exception.

However, the average profit level of IPO firms has improved in the last two years. The mean return-on-assets ratio for issuers rose from -42 percent in 2000 to -6 percent in 2001-02. Over the first three quarters of 2003, IPO firms achieved a positive 3.9 percent return on assets. This upturn in profitability provides some evidence that market participants have begun to underwrite and invest in financially stronger companies.

Notes

1. The underpricing of IPOs—evident in the difference between the offer price and the first-day closing price—appears to be inconsistent with efficient market theories (see Ritter [2002]). Several studies have documented a persistent underpricing in both domestic and foreign IPOs. A recent review paper by Welch and Ritter (2002) finds that the first-day return for new issues during the periods 1980-89 and 1990-2000 was 7.4 and 15.2 percent, respectively.

- 2. See, for example, Nelson D. Schwartz, "The Ugly Truth about IPOs," *Fortune*, November 23, 1998; Mike Tarsala, "The IPO Market Is as Sleazy as Ever," *CBS MarketWatch.com*, September 18, 2002; and Amy Schiffrin, "When IPOs Get Called Off," *Newsweek*, October 16, 2000.
- 3. The return on equity is often considered to be a more accurate measure of firm profitability. Unfortunately, the return on equity is undefined for many issuing firms that have negative worth prior to going public. Net income (or loss) is defined as total revenues and gains in the quarter minus expenses (including extraordinary items and discontinued operations but excluding interest expenses). To obtain a more representative measure of the earning capacity across all firms with and without debt, we excluded interest costs from total expenses. We also considered several other profitability measures such as pretax return on operating assets and pretax return on total earning assets. Overall, our findings were very similar for all of the different financial ratios.
- 4. All pre-IPO financial ratios represent the average performance of the firm up to eight quarters before going public. To be included in the sample, an IPO firm must have at least two quarters of reported financial information in Standard and Poor's Compustat database. Chart 1 tracks the equally weighted average performance of issuers by year. We eliminated a handful of outliers from the data to guarantee consistency over time.
- 5. More precisely, the nonissuing firms in the control sample are similar to the issuing firms in market capitalization (size) and the ratio of market value to book value in the first month following the issuing firms' IPO date. To be included in the control sample, a firm must have traded for at least five years before the IPO date without offering any secondary shares to the market.
- 6. Common equity consists of common stock outstanding (including Treasury stock adjustments), capital surplus, and retained earnings.
- 7. The IPO sample includes 463 Internet-related firms that issued stock primarily in the late 1990s.
- 8. We used market shares and the Carter-Manaster rank scores to identify toptier underwriters in each decade (Carter and Manaster 1990). For the 1990s, this group comprises Goldman Sachs, Merrill Lynch, Morgan Stanley, Deutsche Bank/Bankers Trust/Alex. Brown, Credit Suisse First Boston, Smith Barney, First Boston Corporation, Lehman Brothers, Salomon Brothers/Salomon Smith Barney, Donaldson Lufkin & Jenrette, Chase Hambrecht & Quist, and JP Morgan Securities. In the 1980s, the top underwriters were Merrill Lynch, Shearson Loeb Rhoades, Goldman Sachs, Alex. Brown, Paine Webber, Morgan Stanley, Kidder Peabody, E.F. Hutton, L.F. Rothschild, Prudential Bache, Lehman Brothers, Salomon Brothers, First Boston, and Drexel Burnham Lambert.
- 9. A performance delisting occurs when the firm fails to meet one or more of the required minimum listing requirements. For example, a firm may cease

trading if it has insufficient capital, or if its stock price falls below a specified level. Often, negative-performance delistings are preceded or closely followed by bankruptcy filings or regulatory actions that result in formal closure. Securities relegated to secondary exchanges (for example, the over-the-counter Bulletin Board, or OTCBB) often end up being delisted again, or they decline into penny stocks. The Center for Research in Security Prices (CRSP) uses a variety of codes to identify performance-related delistings. We adjusted the CRSP data by using information from Bloomberg Financial. Furthermore, we used Bloomberg information to verify the final status of every delisted firm. In the end, a security was considered a failure and kept in the delisting sample if it had resulted in a huge loss to shareholders (that is, the median last quoted price for a delisted firm was less than one cent per share).

- 10. The delisting rate for new issues peaks about four to five years after the IPO.
- 11. Peristiani (2003) estimates a more rigorous cross-sectional time-series model comparing the aftermarket survival of IPO and non-IPO firms.

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Current Issues in Economics and Finance is published by the Research and Market Analysis Group of the Federal Reserve Bank of New York. Dorothy Meadow Sobol is the editor. Back issues of *Current Issues in Economics and Finance* are available at http://www.newyorkfed.org/rmaghome/curr_iss/>.

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