

IPO VALUATIONS OF INDUSTRY IN EQUITY MARKET

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ABSTRACT

The successful timing of an IPO can provide significant benefit. Taking companies public when their equity valuation is high makes it possible to raise more funds when their cost of capital is low. Successful timing also minimizes the dilution of the entrepreneur's ownership stake, and increases the payoff from an exit strategy to venture capitalists and others who provided seed capital during firms' early stages. Evidence is provided here about the timing of IPOs relative to market conditions before and after IPO offerings. It is found that firms are, on average, more likely to go public when the market valuation of comparable stocks in the same industry is at its peak relative to the entire market. In contrast, no evidence is found of a pattern of IPO firms timing their offerings with respect to market-wide conditions.

Keywords: Initial public offerings, Market and industry valuations

INTRODUCTION

The successful timing of an initial public offering (IPO) can provide significant benefit. Taking companies public at propitious market windows makes it possible to raise more funds, that is, it allows firms to obtain capital when their cost of capital is low. Successful timing also minimizes the dilution of the entrepreneur's ownership stake, and increases the payoff from an exit strategy to venture capitalists and others who provided seed capital during firms' early stages. Moreover, successful timing of IPOs may enhance the reputation of investment banks, increasing their access to future IPOs. The importance of IPO timing is often emphasized by practitioners. Consider, for example, the following quote by Foerster (1990), made while he was a managing director of Paine Webber Incorporated.

The managing underwriter's aim is to time the IPO so that it occurs during an upmarket and positive industry cycle, to find the market window, and launch the IPO before the window closes (this task is anything but easy considering that the process of mounting an IPO ordinarily takes six to nine months from start to finish). If the window should close before the IPO has taken place, the issuer and underwriter may decide, quite properly, to wait for a more propitious time to offer the stock, however painful this decision may be in the short run. Proceeding when the market does not want an issue is an open invitation to damage, perhaps permanently, the issuer's reputation in the market and thereby restrict or eliminate future financing alternatives.

Despite the importance practitioners place on the timing of IPOs, surprisingly little attention

is given to it by academicians. Lerner (1994) is one exception. He examines the timing of 136 IPOs of venture-capitalist backed firms in the biotechnology industry between 1978 and 1992. He shows that these firms go public when the valuation of industry stocks are high, and that seasoned venture capitalists appear to be particularly proficient at taking companies public when industry stock prices reach their peak. More specifically, Lerner studies the performance of raw returns of an industry index in the three months before and after the offering date. His industry index is composed of thirteen "comparable" companies that he identified from the 1977 business press. He shows that, on an average, there is a 9.9% increase in the industry index in the event window (day -60, day -1), and a decrease of 4.6% in the event window (day + 1, day +60). Since Lerner investigates the performance of raw returns of the industry index, it is not clear to what extent his findings are driven by industry conditions or market-wide conditions. He also suggests that for IPOs in other industries, the demand for capital and the adjustment for oversight by active investors may be more important for the decision to go public than market conditions.

However, the question is left unresolved whether IPOs are, in general, tied at propitious market windows. The issue addressed in this study is whether IPOs are, in general, timed when they are highly valued. IPO timing is measured by relying on the performance of an index composed of publicly owned companies engaged in the same or similar business. It is a difficult task to determine the market value of firms prior to their IPO, both because they do not have a market price and because some issuing firms have little or no operating history. One starting point for determining the market value of the IPO firms is the comparison of their operational and financial performance and status with that of publicly owned companies in the same or similar industry. Thus, it is presumed that the timing decision of IPO firms is likely to be governed by the current market valuation of comparable firms in the same industry.

This study examines empirically how the market valuation of the comparable firms in the same industry affects IPO timing decisions. Moreover, it is investigated whether IPOs are timed with respect to market-wide conditions, as opposed to industry conditions. To the best of my knowledge, this is the first attempt to examine IPO timing beyond Lerner's biotechnology firms. It is also the first to look at the timing of new stocks with respect to industry conditions. Unlike this study, prior studies of IPOs and seasoned equity offerings (SEOs) investigate timing with respect to firm-specific or economy-wide conditions.

The analysis of this study on the timing pattern of IPO firms may also shed new light on the issue of the long-run post-issue underperformance of IPOs documented by Ritter (1991) and Loughran and Ritter (1995). They show that IPOs significantly underperform the market over the five years after going public, and that the poor performance is neither a risk effect nor a long-term return reversal. They call this long-term pricing abnormality the "new issue puzzle". One possible explanation they offer to resolve this puzzle is that firms take advantage of transitory windows of opportunity by issuing equity when, on average, they are substantially overvalued. However, they do not show direct evidence on whether IPO firms time their offerings. In contrast to prior studies, this study provides evidence on whether IPO firms time their offerings relative to market conditions before and after the IPO.

The outline of this study is as follows. The first section provides a description of the sample and methodology. The second section presents empirical results related to the timing pattern of IPOs and offers tests of the robustness. The last section concludes the study.

SAMPLE AND METHODOLOGY

A. Sample: The primary sample consists of IPO firms that went public between 1980 and 1991. These companies are identified through the semiannual editions of the Investment Dealer's Digest: Corporate Financing Directory. The offering date is obtained from this source. Information about the filing date is retrieved from weekly editions of the Investment Dealer's Digest. The Standard Industrial Classification (SIC) codes for IPO and seasoned firms, as well as other information about seasoned firms, are obtained from the Center for Research in Security Prices (CRSP) files. The following criteria are used for inclusion in the IPO sample:

- (1) Regulation A offerings and unit offerings are excluded.
- (2) IPO firms are listed in the New York Stock Exchange (NYSE), the American Stock Exchange (AMEX), or the National Association of Securities Dealers Automated Quotation System (NASDAQ).
- (3) The offering is made through a firm commitment underwriting arrangement.
- (4) IPOs of financial institutions (SIC code 600-699) are excluded; also, foreign companies and American Depository Receipts (ADRs) are omitted.

The resulting sample contains 2,154 IPOs which are drawn from 247 different (three digit SIC code) industries. Table I presents the distribution of IPOs by the 15 major industries that occupy about 50% of the sample. These 15 industries are ranked in terms of the number of IPOs brought to market in the sample period. Panel A shows the number of IPO firms coming to the market in the 1980-1991 period and their industry descriptions. 1983 has the highest representation (18%), 1986 the second highest (14%), and 1987 the third (12%). There are high levels of industry concentration among IPO firms. About 25 % of IPOs are in four high-technology industries: computer and data processing services, computer and office equipment, medicinal and biological products, and electronic equipment. An additional 25 % of the IPOs are drawn from 11 industries such as medical instruments, communication, and food and beverage outlets.

Panel B shows the annual number of firms coming to market, by year and industry. It reveals that the number of IPOs is not evenly distributed across industries over the sample period. In the computer and data processing industry (SIC code 737), there is a clustering of IPOs in 1983, 1986 and 1991. In the computer and office equipment industry (SIC code 357), there is a clustering of issues in 1983. In the communication industry (SIC code 366), there is a clustering of IPOs in 1983. However, in industries with fewer IPOs, the observed pattern of clustering in industries with high IPO volume is less noticeable.

B. Methodology: Market and Industry Indices and Return Measurement

B.1. Market and Industry Indices

To evaluate the timing pattern of IPOs with respect to market and industry conditions, the following market and industry indices are employed:

- (1) The equally-weighted NASDAQ CRSP market index
- (2) The value-weighted NASDAQ CRSP market index
- (3) The size-and-industry-matched index
- (4) The industry-matched index

Of the 2,154 sample IPOs, 1,950 (91%) were initially traded on the NASDAQ, and the rest on the NYSE or AMEX. Since the vast majority of the IPOs trade on the NASDAQ, it is more appropriate to use NASDAQ firms to construct the indices. The first two market indices allow investigation of the timing of IPOs with respect to market wide conditions, while the second two are utilized to examine IPO timing with respect to industry conditions. For these two industry indices, this study employs firms which are in the same industry (three-digit SIC code) as IPO firms that are listed on the NASDAQ for at least three years prior to the filing date of an IPO. This avoids including young IPOs in the industry indices. The size-and-industry-matched index is composed of seasoned firms in the same industry which are close in terms of market capitalization. More precisely, CRSP provides a year-end market capitalization for each issue in every year. The size-and-industry index comprises seasoned firms in the same industry, with sizes lying within a range five times larger than, and one fifth as large as, an IPO firm, in the offering year ($20\% * \text{the size of an IPO firm} - 500\% * \text{the size of an IPO firm}$). On the other hand, the industry-matched index is composed of all seasoned NASDAQ firms that are in the same industry as IPO firms. For the industry indices, this study utilizes not only raw returns, but also excess returns which are raw returns adjusted for the NASDAQ market returns. These excess returns reflect the performance of stocks in the same industry relative to the market as a whole.

B.2. Measurement

This study employs the geometrically compounded (buy-and-hold) return to compute raw returns on the industry indices, because Roll (1983), Blume and Stambaugh (1983), and Conrad and Kaul (1993) show that there is a statistical bias due to measurement errors in accumulated single-period returns over long-event periods. For market returns, the equally-weighted NASDAQ market index as well as the value weighted NASDAQ market index is utilized in this study. Canina et al. (1995) suggest that using an equally-weighted market index may impart upward bias to a benchmark index due to the auto-correlation of the portfolio and individual securities, the bid-ask bounce effect, and the level of stock price. Without this kind of rebalancing bias, it might be more appropriate to use the equally-weighted NASDAQ market index, since the value-weighted NASDAQ index does not account for the return of the small cap stocks. For clarity and ease of exposition, this study primarily reports results using the value weighted NASDAQ market index as the market index. The size-and-industry-matched index, and not the industry-matched index, is mainly employed as the industry index for the same reason.

All reported tests of significance are based on the t-tests and the signed tests. These tests assume that the observations are independent. There is a possibility that, due to clustering of observations in specific time periods, there is a positive correlation between observations which would lead to somewhat overstated significance levels. Thus, if dependence exists, the statistical tests reported in the study provide upper bounds for the true significance levels. The impact of potential dependence between observations on the statistical tests is assessed through an examination of the robustness of the findings.

MARKET AND INDUSTRY PERFORMANCE SURROUNDING IPOs

In what follows, Period 0 represents the time period between the filing date and the offering date. This period, often referred to as the waiting period or cooling period, is particularly important to the investigation of the issue of timing since the formal decision to go public occurs through registration with the Securities and Exchange Commission (SEC) and actual entry in the market occurs at the offering date. During the waiting period, underwriters' pre-selling activity takes place. Pre-filing months are defined relative to the filing date, and post-offering months are defined relative to the offering date, where months are defined as successive 21-trading-day periods. For example, month -1 refers to 21-trading-days before the filing date and month +1 refers to 21 trading-days after the offering date. Thus, the period (-1, 0) refers to the period starting 21-trading-days and concluding one-trading-day, before the filing date. Again, the period (0, + 1) represents the period beginning one-trading-day and ending 21-trading-days after the offering date.

A. Market and Industry Performance

A.1. Market Performance: Columns 2 and 3 of Table II and Figure 1 present the performance of the equally weighted market index surrounding IPOs for various time windows from one year before the filing date until one year after the offering date. The average market return for the 12 month period preceding the filing date is 35.08%. For the shorter intervals [period (-11, 0) through period (-1,0)], the change in average market returns suggests that the market-wide level of stock prices rises continuously until the filing date. The average market return during the waiting period is also positive (2.50%). The average market return is still positive in the 12 months after the offering date (13.86%), even though the magnitude is smaller than before the filing date. The behavior of average market returns for shorter intervals [period (0, + 1) through period (0, + 11)] indicates that the general level of stock prices registers a continuous increase after the offering date.

A similar picture emerges when the performance of the value-weighted market index is examined, as reported in Columns 4 and 5 of Table II and Figure 1. The one year average market return for the 12-month period preceding the filing date is 28.45%. The increments in average market returns for shorter intervals [period (- 11, 0) through period (-1, 0)] suggest that IPOs are preceded by positive market return performance. The average market return during the waiting period is also positive (1.71%). The average market return is still positive in the 12 months after the offering date (5.86%). Examination of average market returns for shorter intervals [period (0,

+ 1) through period (0, + 11)] reveals that IPOs are followed by positive market return performance.

These results suggest that, despite the fact that IPOs are sold following an increase in the general level of stock prices, IPO firms do not appear to time the market. This is due to a continuous rise in the general level of stock prices in both the one-year periods preceding and following IPOs. This timing pattern of IPOs in relation to the performance of the market indices is somewhat comparable to that of SEOs documented by Asquith and Mullins (1986). Even though their sample period is different from that of this study, the result is similar in terms of the direction of the stock market as a whole. More specifically, they study the timing pattern of SEOs issued during the period 1963-1981, and find that the average market return is positive in the two years preceding the announcement of the issue and remains positive in the two years following the issue. In the (day -240, announcement day) window, which is approximately comparable to the (-12, 0) window of this study, the cumulative average value-weighted market return is 12.5%. In the (announcement date, day +240) window, which is comparable to the (0, + 12) window of this study, the cumulative average value-weighted market return is 5.4%.

A.2. Industry Performance

In contrast to a lack of the timing of IPOs with regard to the general level of stock prices, the return performance of industry stocks surrounding IPOs reveals a significantly different picture. Consider first the performance of the size-and industry-matched index when the returns on the index are adjusted for the equally-weighted market return. As reported in Column 3 of Table III and Figure 2, the one-year average excess return before the filing date is 15.18 % (significant at the 1% level). The average waiting period excess return is 0%. The one-year average excess return following the offering date is -8.46% (significant at the 1 % level). Examination of shorter interval excess returns suggests that industry stocks outperform the market and rise continuously before the filing date. However, subsequent to the offering date, the superior performance ceases and below average performance is observed. The average market-adjusted stock price of the index declines continuously after the offering date.

Although it is observed that there is a positive average excess return before the filing date and a negative average excess return occurs after the filing date, it is possible that these results are driven by a relatively small number of outlier returns. One way to consider this possibility is to investigate the fraction of observations with positive excess returns and test for its significance. Column 4 of Table III shows that the percentage of observations with positive one-year excess returns preceding the filing date is 56.7% (significant at the 1 % level).⁷ The percentage of positive excess returns for the waiting period is 47.9% (significant at the 10% level). The percentage of positive one-year excess returns following the offering date is 33.3%.

Examination of shorter interval excess returns indicates that in the periods before the filing date, over or close to 50% of the observations have positive excess returns. However, after the filing date, less than 50% of the observations have positive excess returns for all intervals. Thus, these results indicate that the timing pattern of IPOs in regard to industry stock

performance is not due to outlier observations.

Using the industry returns adjusted for the value-weighted market return yields similar results. The one-year average excess return before the filing date is 22.12% (significant at the 1 % level). The average waiting period excess return is 0.76% (insignificant). The one-year average excess return following the offering date is -0.62% (insignificant). Excess returns over shorter intervals indicate that industry stocks outperform the market before the filing date. However, subsequent to the filing date, abnormal performance ceases and average performance is observed. The fraction of positive excess returns before the filing date provides another insight, as reported in Column 6 of Table III. The fraction of positive excess returns before the filing date is over 50% for all intervals. The fraction of positive excess returns during the waiting period is 50%. The fraction of positive excess returns after the offering date is below 50% over all intervals. In sum, these results suggest that IPO firms are, on average, more likely to go public not only when the market valuation of comparable stocks in the same industry is high, but there is also a tendency to attain the maximum levels, relative to the market as a whole.

B. Robustness: The above results suggest that IPO firms are, on average, more likely to go public when the market valuation of the comparable stocks in the same industry is at its peak. However, there are several concerns about the observed timing pattern of IPOs with respect to the performance of comparable stocks in the same industry. First, the observed timing pattern might be concentrated in particular industries. Second, it may be concentrated in some periods. Finally, it may be sensitive to the particular index selected. Thus, it is necessary to verify the robustness of the observed timing pattern of IPOs with respect to the performance of comparable stocks in the same industry by examining these possibilities. For ease of exposition, the value-weighted market index is employed as the market index from here onwards.

B.1. Industry Concentration

While the above results show the timing pattern of IPOs with respect to the prices of stocks in the same industry, it is possible that these results are dominated by a few industries which are heavily represented in the sample. Considering the fact that, out of 247 industries, four industries represent 25% of IPOs in the sample and 15 industries occupy nearly 50% of the sample (Table I and Table IV), it is conceivable that a few industries are producing these excess returns. To ascertain the consistency of the timing pattern of IPOs across the industries, the sample is split into four subgroups of industries so that there are approximately equal numbers of IPOs in each subgroup. First, all industries in the sample are ranked according to the number of IPOs per industry. Then, the whole sample is divided into four subgroups. The first subgroup represents the group of industries which has the biggest representation of IPOs in the sample, followed by the second, third, and fourth groups. Table IV presents some descriptive statistics of these four subgroups. The average number of IPOs per industry over the sample period is 137.7, 40.3, 12.8, and 2.8 for the first, second, third, and fourth subgroups, respectively. Table V depicts the performance of the industry index for all four subgroups. In general, a similar timing pattern is observed for all four subgroups in terms of the direction of performance. These results suggest that the timing pattern of IPOs is not limited to the small number of industries which are

heavily represented in the sample.

B.2. Sub-periods

Although the observed timing pattern of IPOs is not restricted to a few industries, it is still possible that these results are dominated by a shorter sub-period. To consider this possibility, the sample period is divided into two time intervals, 1980-1985 and 1986-1991 and an investigation is conducted on the performance of the size-and-industry matched index for each sub-period. Each period has the same number of IPOs (1,077 IPOs). As reported in Table VI, for both sub-periods, there is still the same pattern of timing of IPO firms around the filing date. Stocks of the industry index earn positive excess returns prior to the filing date. Subsequent to the filing date, above-market performance ceases and average performance is observed. The one-year average excess return before the filing date is 32.09% (significant at the 1% level) for the 1980-85period, compared with 12.09% (significant at the 1% level) for the 1986-91 period. The average waiting period excess return is 0.32% (insignificant) in the first sub-period and is 1.21 % (significant at the 1% level) in the second. The one-year average excess return following the offering date is -2.55% (significant at the 1 % level) and 1.32% (insignificant) for the first and second sub-periods respectively. Examination-of shorter interval excess returns indicates that the average stock price of the industry index outperform the market before the filing date and perform almost at par with the market after the offering date. These results indicate that the observed timing pattern of IPO firms is not restricted to a particular sub-period.

B.3. Index

To form the size-and-industry-matched index, this study employed seasoned firms in the same industry that have been listed on the NASDAQ for at least three years, as of the IPO filing date and are close in terms of market capitalization. As an alternative, the timing pattern of IPOs is examined with another industry index that is composed of all firms in the same industry that have been listed on the NASDAQ for at least three years, as of the IPO filing date (the industry-matched index). A similar picture emerges again. As reported in Table VII, positive abnormal performance is still observed before the filing date and average performance occurs thereafter. These results suggest that the timing pattern of IPOs is not driven by a particular industry index. However, in pre-filing periods, the performance of the industry-matched index is weak relative to that of the size-and-industry matched index. The one-year average excess return preceding the filing date is 10.21% (significant at the 1% level), compared to 22.12% for the size-and industry matched index. There is little difference in the performance of the two indices in post-offering periods.

CONCLUSION

The successful timing of an IPO can provide significant benefit. Taking companies public when their equity valuation is high makes it possible to raise more funds; that is, it allows firms to obtain capital when their cost of capital is low. Successful timing also minimizes the dilution of the entrepreneur's ownership stake, and increases the payoff from an exit strategy to venture

capitalists and others who provided seed capital during firms' early stages.

The issue addressed in this study is whether IPOs, in general, are timed when they are highly valued. IPO timing is measured by relying on the performance of an index composed of publicly owned companies engaged in the same or similar business. It is a difficult task to determine the market value of firms prior to their IPO, both because they do not have a market price and because some issuing firms have little or no operating history. One starting point for determining the market value of the IPO firms is the comparison of their operational and financial performance and status with that of publicly owned companies in the same or similar industry. Thus, the timing decision of IPO firms is likely to be governed by the current market valuation of comparable firms in the same industry. Evidence is provided here about the timing of IPOs relative to market conditions before and after IPO offerings. It is found that firms are, on average, more likely to go public when the market valuation of comparable stocks in the same industry is at its peak relative to the entire market. In contrast, no evidence is found of a pattern of IPO firms timing their offerings with respect to market-wide conditions.

The analysis of this study on the timing pattern of IPO firms also shed new light on the issue of the long-run post-issue underperformance of IPOs documented by Ritter (1991) and Loughran and Ritter (1995). They show that IPOs significantly underperform the market over the five years after going public, and that the poor performance is neither a risk effect nor a long-term return reversal. They call this long-term pricing abnormality the "new issue puzzle". One possible explanation they offer to resolve this puzzle is that firms take advantage of transitory windows of opportunity by issuing equity when, on average, they are substantially overvalued. However, they do not show direct evidence on whether IPO firms time their offerings. In contrast to prior studies, this study provides evidence on whether IPO firms time their offerings relative to market conditions before and after IPO offerings.

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