IPO Offer Prices and Firm Performance

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Abstract

This paper explores the determinants of IPO prices and studies the relationship between price choice of firms going public and post-issue stock performance and firm characteristics. I find that IPO prices positively relate to median industry prices, underwriter reputation, and book-to-market ratio of the firm going public. I further show that raw and risk-adjusted stock returns of IPOs monotonically increase with the ratio of offer price to average industry price. The difference in returns between IPOs with the highest and lowest relative offer prices averages 9% during one year following the issuance, and exceeds 60% over five years. The group of IPOs with high relative prices does not exhibit any underperformance relative to matches at any horizon. I also document a positive relation between underpricing and relative offer prices. I further show that firms with high relative prices generate better earnings after going public. These firms have larger market betas around the IPO, and spend considerably more on investment during five years following the offering.

1. Introduction

Nymex Holdings and Western Refining both started trading on the New York Stock Exchange in 2006 and both raised exactly $383.5 million during their respective offerings. However, shares of Western Refining were priced at $17, while Nymex shares, at $59, were more than three times as expensive. Such dramatic differences in prices of seemingly comparable firms are puzzling, and IPO price choice and its consequences have so far been largely left unexplored in the finance literature.

Aside from the regulatory requirements imposed by the exchanges, firms going public have considerable flexibility in choosing a price for their offering. Yet, anecdotal evidence hints at a link between the offer price and characteristics of the issuer. For instance, new entrants into the mining industry are overwhelmingly low-priced stocks just like their already-listed peers. Also, as Lipman (2000) notes in the *Complete Going Public Handbook*, underwriters usually reserve higher prices for more "prestige" issues. Indeed, while the median IPO price in the 1986–2006 period was just $12, Google debuted at $85 a share, Mastercard started trading at $39, and Visa's offering was priced at $44.

Anecdotal evidence also suggests that there may be a link between issuance price and subsequent performance. For instance, Graham and Dodd observed in the 1962 edition of their *Security Analysis* that "Undoubtedly, more money was lost than made [by the general public buying low-priced shares]. The reason may be either because the companies are in bad financial condition or because the common stock is low-priced in appearance only and actually represents a full or excessive commitment in relation to the value of the enterprise. The latter is preponderantly true of new security offerings in the low-priced range."

In this paper, I explore the determinants of IPO offer prices, examine the relationship between the choice of the issuance price and post-IPO stock performance, investigate the levels of underpricing of issuers with different offer prices, and study the link between issuance prices and firm characteristics including profitability, risk, and investment.

First, I show that IPO prices are positively related to median prices of stocks that are already trading in the same industry. They are also positively linked to the ratio of book to market equity, number of shares issued, as well as underwriter reputation.

Second, this paper presents evidence that a simple ratio of IPO offer price to the median price of stocks in the same industry strongly relates to the future stock performance of the firm going public. The return difference between quintiles of firms with high and low relative prices is striking, amounting to 9% in just the first year following the IPO. Abnormal returns exhibit a similar pattern, with differences rising from 13% over the first year to 32% over three years. Similarly, differences in market, 3- and 4-factor model alphas average approximately 7% annually.[1] Interestingly, IPOs in the highest relative price quintiles do not exhibit any underperformance following the issue, while those in the lowest quintile underperform their matches by over 9% in just the first year. These results are robust to controlling for size, book-to-market, and industry differences. I show that they are driven by *relative* rather than raw stock or industry prices. The difference in stock performance is also persistent over time: an investment strategy that buys IPO stocks in the highest relative price quintile and holds the position for five years returned on average 1.28% per month during the 1986-2006 period, while a similar investment in the lowest group yielded just 0.21%. The difference between returns of the two quintiles cannot be explained by the commonly used asset pricing models.

Third, I document that firms with higher relative prices are considerably more underpriced. Firms in the top quintile rise on average by 28% on the first day of trading, while those in the bottom group are underpriced by just 13%.

Finally, this article provides evidence that firms with larger relative IPO prices have higher market betas, and finds that these loadings decline following the issue. It further shows that firms with higher relative prices report larger investment expenditures than do their peers with lower measures. Moreover, firms with more expensive shares report stronger measures of profitability.

[1] These numbers are calculated excluding several first trading days. Including the effect of underpricing makes the differences in returns even larger.

The ratio of operating income to total assets of the quintile of firms with the highest relative prices averages 2.7% in the five years following the IPO, while the comparable figure for those in the lowest group is around zero.

This paper contributes to several strands of literature. It complements the voluminous work on post-issuance return and accounting performance of the firms going public,[2] relates to the body of literature exploring the relation between the level of share prices and stock returns,[3] adds to the studies of IPO underpricing (e.g. Stoll and Curley (1970), Logue (1973), Reilly (1973), and Ibbotson (1975)), and contributes to the vast marketing literature studying the pricing of products (see, e.g. Gabor (1988) and references therein).

The rest of the paper proceeds as follows. Section 2 discusses the determinants of IPO prices. Section 3 presents evidence of a positive relation between relative offer prices and raw and risk-adjusted post-IPO returns as well as the level of underpricing. In Section 4, I study the link between relative prices and profitability, risk, and investment. Section 5 explores potential explanations for the findings. Section 6 provides evidence that relative prices also serve as significant predictors of returns following stock splits. Section 7 concludes.

2. Determinants of IPO Prices

IPO firms have considerable flexibility in choosing a price for their offering, even after conforming with the regulatory requirements of the exchanges. For instance, listing standards of NYSE currently include having a minimum of 1.1 million shares outstanding and market value of at least 60 million. Continued listing requirements call for the per share price to not fall below $1 for 30 straight days.

[2]Long-run underperformance of IPOs, both in the U.S. and foreign markets, has been widely studied (e.g. Ritter (1991), Loughran and Ritter (1995)). Jain and Kini (1994) and Mikkelson et al. (1997) document poor post-IPO accounting performance of the newly listed firms. Brav and Gompers (1997) present evidence that most of the underperformance is concentrated in small, nonventure-backed IPOs. Carter et al. (1998) find that IPO underperformance is less severe for firms managed by more reputable underwriters. Purnanandam and Swaminathan (2002) show that IPOs tend to be overvalued, and that underperformance following the issuance increases with the degree of overvaluation.

[3]Seguin and Smoller (1997) and Fernando et al. (2004) study the link between share prices and delisting but do not examine the returns or accounting performance. Muscarella and Vetsuypens (1996) examine price choices of American Depositary Receipts. The vast research on stock splits also explores of the firm's choice of the post-split price (e.g. Lakonishok and Lev (1987), Angel (1997), Schultz (2000), and Anshuman and Kalay (2002)).

Thus, even the smallest company eligible for listing on NYSE is free to choose an offer price anywhere between $1 and $54.54. The degree of dispersion among prices is indeed high even for IPOs of similar size: among the quintile of firms with the largest market capitalization that went public in 2006, offer prices ranged between $9.75 and $59 a share. Motivated by these observations, in this Section I explore the determinants of the issuance prices of the firms going public.

2.1. Data

From the Securities Data Company (SDC), I identify all IPOs of common stocks by U.S. corporations during the 1986–2006 period.[4] I require certain filing information such as offer price and issue date, as well as the Center for Research in Security Prices (CRSP) data to be available for each stock. The final sample contains 5,194 issues, with median (mean) offer price for all IPOs of $12 ($12.09).

For each IPO, I obtain the number of shares, ranking of underwriter reputation, median industry price, 12-month runup in industry returns, and the ratio of book to market equity. Underwriter reputation is based on Carter and Manaster (1990), Carter et al. (1998), and Loughran and Ritter (2004) rankings. It is a number between 1 and 9, with average (median) rank of 7.23 (8.00). Median industry price is calculated as of one week prior to the issuance day and thus excludes the price of the IPO firm. Industry assignments are based on the 49 industries defined on Kenneth French's website.[5] Industry runup is defined to be the difference in log returns of value-weighted industry and market portfolios, computed using 12 months of data ending in the month prior to issuance. Finally, book-to-market ratios are based on book equity value from SDC and market value as of the end of the first trading day. If SDC book data is not available, following tradition in this literature, book equity is taken as the first observation from COMPUSTAT files given that fiscal quarter end

[4]SDC IPO data is very sparce prior to 1986. The sub-sample from 1971 to 1985 contains around 40 issues. Because our analysis requires ranking stocks into at least five groups each quarter or year, assigning ranks to pre-1986 issues carries little meaning, and we exclude this data.

[5]http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html. The results of this and following Sections are robust to alternative industry specifications such as those based on 2-digit SICs or Kenneth French's 17-industry classification.

is within one year of the issuance date. Similarly to Brav and Gompers (1997), COMPUSTAT book equity is defined as book common equity plus balance sheet deferred taxes and investment tax credit.

2.2. What Explains IPO Prices?

Table 1 reports the results of regressing IPO offer prices (Panel A) or the midpoints of the filing range (Panel B) on explanatory variables.[6] Regression (1) clearly shows that issuance prices strongly and positively relate to the number of shares. For a company of given market capitalization, price and number of shares are certainly inversely related, so if all IPOs were of the same size, one would expect a negative coefficient. The positive relationship that we observe is likely driven by the larger firms that both set higher prices and have a higher number of shares.

Prior research (e.g. Carter and Manaster (1990), Carter et al. (1998)) documents that underpricing and underwriter reputation are negatively related. Regression (2) complements this work by showing that more reputable underwriters choose higher prices for the issues. This result is very strong, with a t-statistic of 41.65 (19.92) when offer price (midpoint of filing range) is the dependent variable.[7] Why more respected underwriters tend to choose higher prices is somewhat puzzling. Perhaps they shy away from setting cheaper prices because such issues lack "prestige", or maybe they attempt to convey better quality of the IPO by pricing shares expensively. Fernando et al. (2004) find that institutional ownership increases with the chosen issue price, and since reputable underwriters tend to deal with more institutions, setting high prices may be a way of catering to these large investors.

Regression (3) documents a positive relationship between IPO and median industry prices. Stock prices differ greatly among different industries: as Table 2 shows, median price for firms in the precious metals industry was just \$4.27 at the end of 2005, while a similar number for tobacco

[6] All regressions include year dummies and NYSE dummy, which is set to 1 if the IPO is listing on the New York Stock Exchange and to 0 otherwise.

[7] Fernando et al. (2004) mention the positive relationship between underwriter reputation and midpoint of the filing price range. Their focus, however, is to explain the underwriter rank, and the regression they consider has the price as one of the right-hand-side variables.

firms amounted to $52.60. Table 2 also confirms the message of Regression (3) that entrants into higher (lower) priced industries tend to choose significantly higher (lower) prices. For example, the median price of the 23 pharmaceuticals industry IPOs in 2006 was $9, close to the industry median price of $7.75. At the same time, the median price of the 17 firms entering the trading industry was $15, in line with the industry median of $16.13.

To check whether median industry price simply proxies for return runup in the industry, Regressions (4) and (5) include 12-month runup relative to market. While offer prices do relate positively to relative industry runup, midpoint of filing range is clearly unrelated to this variable. Industry median price retains its significance, with coefficient and corresponding t-statistic barely changed.

The final regression of Table 2 indicates that both offer and filing prices are positively related to the book-to-market ratio. This finding is also intriguing. Perhaps higher book-to-market stocks are viewed as being less speculative than other IPO issues, and underwriters indicate this by selecting higher prices for such firms.

It is also interesting that R^2 values are dramatically lower in regressions of Panel B, where midpoint of filing range rather than offer price is the dependent variable. The choice of the filing price is thus more puzzling of the two, and offer prices are stronger related to the considered characteristics of the issue. The next section focuses on the offer prices and studies how the choice of price relates to the post-IPO stock performance.

3. Relative Prices and Post-Issue Stock Performance

This Section documents a strong positive relation between the firm's choice of IPO price relative to prices of industry peers and post-issue stock performance.

For every IPO, I compute a measure of relative price, defined as the offer price divided by the median price of the industry into which the firm is entering. This definition of relative prices is motivated partly by the finding of a positive relationship between IPO and industry prices documented above, and partly by what is known in the marketing literature as Weber's law, which

states that buyer's reaction to price differences for an item is directly proportional to price level for comparable items.[8] So if a median price of stocks in the industry is \$10, and the new IPO is issued at \$15, we should perceive this difference as greater than the one for a \$25 issue in an industry with a median price of \$20. Certainly, there are plenty of examples when offer prices are considerably above or below the industry median value. For instance, Oracle issued its IPO on March 12, 1986 at the price of \$15 a share, and Microsoft followed the very next day, priced at \$21. The median price of the companies in the computer software industry at that time was around \$6.50. How these "prestige" issues, as well as those that price their offer well below industry average, perform following the IPO is one of the key questions addressed next.

3.1. Raw and Abnormal Returns

To explore the relation between relative prices and post-IPO raw and risk-adjusted returns, firms are assigned into groups based on their relative prices. Smaller firms tend to choose lower offer prices, and to filter out size effects, each quarter stocks are first sorted into three groups based on their market equity as of two weeks following the IPO.[9] Then, within each size group, they are assigned into relative price quintiles. As a result, average market capitalizations are similar across price quintiles.[10]

I begin the investigation by looking at the post-IPO raw returns of each group. I compute average buy-and-hold returns for n-month periods beginning two weeks following the issue, where $n \in \{1, 2, ..., 12\}$ and months are defined to be 21-day intervals,[11] and further calculate buy-and-hold returns for 2-, 3-, 4- and 5-year periods beginning in the calendar month after the issue month.

[8] Our results remain robust to defining relative price as difference between offer price and median price, to using mean rather than median industry price, and to using midpoint of the filing range rather than offer price.

[9] The motivation for assigning IPO stocks into relative price groups quarterly stems from the observation that mean and median offer prices have trended significantly higher during 1986-2006 period. Assigning stocks into groups annually rather than quarterly does not affect our conclusions.

[10] The empirical results are, if anything, stronger, if we do not sort on size prior to grouping stocks into relative price quintiles.

[11] I arbitrarily choose to ignore the two weeks following the IPO in our calculations to avoid capturing effects related to underpricing or volatility immediately following the issue. The results are robust to measuring returns beginning on the day immediately following the issue date.

To ensure robustness of the results, I estimate several types of abnormal returns.[12] First, AR_{Mkt} is defined as the difference between raw returns of the IPO stocks and those of the value-weighted market index from CRSP. Second, all new issues are assigned into size deciles based on the NYSE market equity breakpoints, and AR_{SzDec} is computed as the difference between raw returns of IPO firms and of the portfolio of stocks in the same size decile. Next, I calculate AR_{SzInd} as the difference between raw returns of the IPO stock and the closest in market equity stock in the same industry. Matching on size is done as of two weeks following the issue date. If a match ceases to exist, it is replaced by the next closest size match from the same industry.

Finally, AR_{SzBM} is computed as the difference between returns on IPO stock and a matched size and book-to-market portfolio. In computing size and book-to-market breakpoints and returns, this paper closely follows the methodology outlined in Brav and Gompers (1997). Specifically, starting in January of 1986, all NYSE stocks are used to create size quintile breakpoints with equal number of firms in each group.[13] Size is measured as the market capitalization as of the end of the previous month. Book equity is calculated using the data from COMPUSTAT as common equity plus balance sheet deferred taxes and investment tax credits for the fiscal quarter ending two quarters prior to the portfolio assignment date. If book value is missing in the quarterly data, I use annual files requiring at least six months between fiscal year end and portfolio formation. Within each size group, breakpoints are calculated based on assigning stocks into five book-to-market quintiles. Value-weighted returns for the next three months are then calculated for each of the resulting 25 portfolios, which contain approximately equal number of NYSE firms. The procedure is repeated every calendar quarter. Each IPO is then matched to its corresponding portfolio. The numbers reported below are in percent.

Figures 1 through 5 present raw and abnormal returns of the IPO stocks during the 12 months following the issue. All graphs deliver a very similar message: returns of the IPO stocks, whether

[12] All returns are buy-and-hold.

[13] IPOs are excluded from the portfolios during five years following the offering to ensure that issues are not being compared to themselves.

raw or abnormal, monotonically increase with the relative price. Raw returns of the lowest quintile average just 2.08 during the first year following the IPO, while a comparable number for the middle group is 9.88, and amounts to 11.23 for the highest quintile. During the first 12 months after the issue, AR_{Mkt} for the lowest quintile, at -10.86, is remarkably lower than the comparable value for the highest group, -1.91. The other three measures of abnormal returns reiterate this point: the difference in 12-month post-IPO abnormal returns between the top and bottom quintiles is dramatic, amounting to 8.90 for AR_{SzDec}, 9.24 for AR_{SzInd}, and 12.79 for AR_{SzBM}.

Table 3 presents quarterly and annual raw and abnormal returns of the five quintiles and furthers the message from the figures. At practically each examined time horizon, post-IPO returns increase significantly as relative prices rise. The differences in raw and abnormal returns among different quintiles are particularly striking at longer horizons: five-year raw return for the bottom quintile is 53.80, while for the highest group it is more than double this value, at 114.68. Returns in excess of market tell a similar story: 5-year AR_{Mkt} monotonically rises from -31.03 for the first quintile to 29.00 for the top quintile. AR_{SzDec} similarly increases from -21.39 to 44.80, as do AR_{SzInd}, from -52.74 to 39.91, and AR_{SzBM}, from -34.29 to 28.07. Interestingly, the abnormal returns become more negative for the lower quintiles and either stay roughly similar, or increase for the top quintile as we extend the holding period. Table 3 also confirms the widely documented poor performance of the IPO stocks: without conditioning on price, average abnormal returns are negative at all horizons longer than 9 months for each AR measurement method. It is interesting, however, that this underperformance appears to be driven primarily by the bottom three or four quintiles: abnormal returns of the top group are above zero, and are often positive for the fourth quintile.

3.2. Alphas

I further check the robustness of the findings by computing market, as well as Fama-French (1993) 3-factor and Carhart (1997) 4-factor model alphas for the different relative price quintiles. More

precisely, for each stock i, I estimate alphas as intercepts from OLS regressions of the form:

$$R_{it} = \alpha_i + \sum_j \beta_{ij} F_{jt} + \varepsilon_{it},$$

where $F_j = MKT$ for the market, $F_j \in \{MKT, HML, SMB\}$ for the 3-factor, and $F_j \in \{MKT, HML, SMB, UMD\}$ for the 4-factor model. The factors are obtained from Kenneth French's data library. Daily returns are used to compute alphas for n-month periods beginning two weeks following the issue, where $n \in \{3, 6, 9, 12\}$ and months are defined to be 21-day intervals. To account for nonsynchronous trading, the regressions include one lead and one lag return of each factor, as suggested by Dimson (1979). I compute alphas by multiplying intercepts from these daily return regressions by 21 to rescale values to a monthly frequency. I also calculate alphas for 2- through 5-year periods beginning in the calendar month after the issue month. These regressions use monthly data, do not include any leads or lags, and do not rescale alphas.

Average market, 3-, and 4-factor alphas for the five relative price quintiles are presented in Table 4. For each model specification and each time horizon considered, alphas tend to increase as relative prices rise, which is particularly pronounced as time horizons lengthens.[14] For instance, average monthly market model alpha for the lowest group, computed using three years of post-IPO data, is -2.07%, while comparable numbers for the middle and top quintiles are -1.68 and -1.30, respectively. Corresponding 3-factor (-1.99, -1.57, and -1.28) and 4-factor alphas (-1.79, -1.38, and -1.09) exhibit a similar pattern. Even though average alphas of the top quintile are negative for longer time frames, they are significantly larger (on average by around 50 basis points per month) than the values for the bottom group. Thus, controlling for loadings on factors such as market, size, value, and momentum does not eliminate the sharp differences in stock performance of firms in different relative price quintiles.

[14]Negative relation between holding period and alphas is consistent with the previously documented empirical observations that IPO stocks tend to perform well in the first few months following the issue but perform poorly over longer horizons such as two to five years.

3.3. Long-Term Performance of Relative Price Quintiles

The findings documented above are puzzling. Barring some regulatory requirements, the firm going public is free to choose any offer price. In efficient markets, risk-adjusted post-IPO returns should not be predictable and certainly should not be related to a variable as arbitrary as the relative offer price. To check the robustness of these results, I now explore the long-term performance of the strategy that invests in the five relative price quintiles.

At the end of every calendar quarter beginning in March 1986, all IPOs that issued in that quarter are assigned into relative price quintiles as described earlier. On the first day of each quarter from April 1986, I then take a position in each of the relative price quintiles and hold it without rebalancing for the next five years. Investing one dollar in each IPO stock, or investing an amount equal to market capitalization as of the end of the stock's first trading day yields similar average returns, and I focus on the former case.

Table 5 presents average monthly returns and other characteristics for the entire sample period as well as for three subperiods. Confirming the findings discussed above, returns monotonically rise with relative prices, with the most expensive issues generating 1.28% monthly, middle quintile yielding 0.72%, and bottom group resulting in just a 0.21% return per month. While there are no dramatic inter-quintile differences between higher moments, nor between minimum and maximum returns, difference in returns between top and bottom groups, at 1.06%, is statistically significant with the corresponding t-statistic of 4.45. Such a long-short strategy might be difficult to implement due to low liquidity of the stocks on the short side, yet its average returns and their economic and statistical significance are remarkably robust in each of the considered periods.

Table 6 further confirms the robustness of these findings, showing that neither market, nor 3- and 4-factor models can explain the profits from this strategy. Unconditional alphas from each model are similar at 1% monthly, with t-statistics of over 4. The strategy has a positive market beta, but its loadings on value, size, and momentum factors are indistinguishable from zero. Indeed, including these additional factors increases alpha and decreases adjusted R^2 values.

3.4. Relative, Raw, and Industry Prices

The findings presented in this Section provide strong evidence for a positive relationship between relative IPO prices and subsequent stock performance. However, it is not entirely obvious that it is *relative* prices that drive the results. I now provide evidence showing that neither raw IPO offer prices, nor the inverse of median industry price have as strong of a link to post-issuance returns as do relative values. It can be argued that industry prices simply proxy for return runup (industries with higher (lower) prior return will generally have higher (lower) prices), but I rule out the possibility that the findings are driven by a runup in the industry returns.

To check that the results are indeed driven by relative, and not raw or industry, prices, and are not affected by industry runup, I start by repeating the procedure outlined in the previous subsection. More specifically, at the end of every calendar quarter beginning in March 1986, all IPOs that issued in that quarter are assigned into raw and industry price quintiles, as well as into industry return and relative return runup quintiles in the same manner as is done for relative prices. On the first day of each quarter starting in April 1986, I then take a position in each of the quintiles and hold it without rebalancing for the next five years. Industry runup is defined to be 12-month compounded industry return ending in the month prior to the issuance month. Relative industry runup is defined as the difference in 12-month log returns of value-weighted industry portfolio from Kenneth French's website and value-weighted market return from CRSP.

Table 7 presents average returns and other characteristics of the five quintiles. Returns of the relative price groups are reported for comparison in Panel A. In Panel B, IPOs are assigned into quintiles based on *raw* (i.e. not relative) IPO prices. The returns increase somewhat as prices rise, yet the difference between returns of the top and bottom groups is indistinguishable from zero. It is interesting to observe that both standard deviation and skewness of returns fall monotonically as prices rise. Declining skewness may reflect the fact that firms that select high prices for their issues may be aware that there is a possibility of a potential large downward movement in price. These firms may thus set high prices to attempt to reduce delisting risk, which may result from a

large drop in price.

Panel C reports average prices of the IPOs assigned to quintiles based on the reciprocal of industry price (i.e. the denominator of the relative price measure). As is the case with raw prices, returns generally increase as inverse of industry price rises, yet the difference between returns of high and low quintiles is again not statistically different from zero. Moreover, the top two groups do not exhibit any difference in returns, and neither do the bottom two groups.

While the relationship between the inverse of industry price and post-IPO returns is week, it is nevertheless curious that there is a somewhat positive link between them. One possibility for why IPOs entering a low-priced industry earn high returns is that it has experienced a decline, and low price simply proxies for poor recent performance of this industry. One may conjecture that firms try to time their entrance to the market when the industry is at its trough so as to capture a large market share and enjoy above-average returns. To check if this is, indeed, the case, I sort IPOs into groups on the basis of 12-month industry returns (Panel D) or 12-month return relative to market (Panel E). Average returns of each quintile in both Panels are approximately the same, and there is no relationship between industry runup and post-issuance returns.

Table 8 further confirms the findings described above: it presents average 6-month, as well as 1-, 3-, and 5-year post-IPO returns in excess of the corresponding size and book-to-market portfolio (AR_{SzBM}) for quintiles of relative, raw, and reciprocal of industry prices, as well as for industry runup. For ease of comparison, Panel A repeats the results from Table 3 for relative price sorts.

Panel B assigns stocks into groups on the basis of raw offer prices. While the top quintile appears to do better than any other one at 3- and 5-year horizons, the relationship is far from monotonic, and is actually inverse at the 6-month horizon. It clearly shows that relative price does not simply proxy for raw prices of the IPO stocks. In Panel C, firms are sorted into quintiles on the basis of reciprocal of median industry price. Here, the relationship between price and post-IPO returns tends to be positive, yet not monotonic. For instance, quintile 2 generally underperforms the bottom group, while quintile 4 generally outperforms the top one. Panels D and E present average returns

of IPO stocks assigned into quintiles based on industry runup. The returns of neither Panel exhibit any notable relationship between industry pre-IPO returns and stock performance following the issuance. It thus seems sensible to reject the conjectures that the results of this paper are driven entirely by raw or industry prices or by industry returns leading up to the issuance.

3.5. Underpricing

I now briefly examine the level of underpricing for the IPOs in different relative price groups. Underpricing is calculated as the return during the first trading day after the issue, and average level of underpricing for each relative price quintile is reported in Table 9. For the bottom three quintiles, underpricing is quite comparable at around 12 to 13%, but it clearly increases for the other two groups, rising to 18.39% for the fourth quintile, and to 25.60% for the firms with the highest relative prices.[15] Including the jump in prices recorded on the first day of trading would dramatically magnify the results of Tables 3 and 4 discussed earlier.

The positive link between relative prices and underpricing is consistent with high offer prices serving as an indicator of firms' growth prospects as well as with investors associating higher prices with better quality. Both of these explanation imply that high relative prices bring about increased interest from the investors, which justifies the significant runup in prices of stocks in the top quintiles on the first day of trading.

It is curious to point out that while previous research (e.g. Hanley (1993)) finds no robust relationship between underpricing and post-issue performance, the results of this paper indicate that firms with high relative prices exhibit both strong underpricing and high post-IPO returns.

3.6. Relative Prices as Predictors of Post-IPO Stock Returns and Alphas

The empirical results discussed earlier clearly point to the fact that stocks with high relative prices tend to have higher returns and alphas following the IPO. I now examine the ability of relative

[15]The results are different from those of Fernando et al. (2004) who document a U-shaped relationship between offer prices and underpricing. The difference stems from the fact that they examine 'raw' prices while I focus on relative prices.

prices to predict raw and abnormal stock returns and alphas following the issue.

I regress buy-and-hold returns during 1, 3, and 5 years following the issue on relative price, log of market equity, log of book-to-market ratio, underwriter reputation, and year dummies. Panels A through E of Table 10 report the results of these regressions for raw and the four measures of abnormal returns. The five Panels deliver a similar message: relative price is a statistically significant predictor of post-IPO stock returns. Controlling for size, book-to-market, and rating of underwriter weakens the influence of relative price slightly but the relationship between post-issue stock performance and relative prices remains positive and statistically significant.

Regression (1) of every Panel confirm the findings of a positive link between relative prices and stock returns: at each horizon and for each measure of abnormal returns, the coefficient on relative prices is robustly significant, with t-statistic between 2.80 and 6.19. Including log of market equity in Regression (2) reduces the coefficient on relative price for every case, but leaves it statistically significant. The positive coefficient of on size is consistent with findings of Brav and Gompers (1997) who show that underperformance is concentrated in small, nonventure-backed IPOs. It is interesting, however, to point out that this positive size effect appears to be a short-time phenomenon: while market equity is statistically significant in the 1-year horizon regressions, it loses its power entirely as holding period lengthens.

Section 2 documented that firms with higher ratio of book to market equity tend to choose higher prices, and in Regression (3) I include book-to-market ratio to ensure that it does not drive the findings. The coefficient on book-to-market is remarkably robust: IPO firms with higher book-to-market tend to earn better raw and abnormal returns following the issue. However, relative price retains its predictive power even after controlling for book-to-market.

As Section 2 showed, more reputable underwriters tend to chooses higher stock prices for the issues, and Regression (4) includes underwriter rating to control for this. Curiously, in all but one case, underwriter rank strongly and positively relates to future raw and abnormal returns. Yet, aside for a couple cases in the 1-year holding horizon, coefficients on relative price remain statistically

significant.

Panels A through C of Table 11 present the results of regressing monthly alphas calculated using 1, 3, and 5 years of post-IPO data on relative prices. This Table delivers a message similar to that of Table 10, but in terms of alphas: stocks with higher relative prices generate higher market, as well as 3- and 4-factor model alphas. Although in several cases they are not statistically significant at conventional levels, coefficients on relative price are robustly positive for each time horizon and alpha measurement method, even after controlling for size, book-to-market, and underwriter rating. As in Table 10, including market equity in the regressions slightly decreases the statistical significance of relative price, but size remains significant only in 1-year horizon regressions. Book-to-market and underwriter reputation are robustly positively related to post-issuance alphas.

The results of Tables 10 and 11 confirm the findings discussed earlier and presented in Figures 1 through 5 and Tables 3 through 6: relative price is clearly positively related to the post-IPO stock performance of the firm. Issues with higher relative prices generate robustly higher raw and abnormal returns as well as market, 3-, and 4-factor model alphas. I now turn to exploring the relationship between relative prices and firms' earnings, risk, and investment.

4. Link Between Relative Prices and Earnings, Risk, and Investment

In this Section, I study the link between relative prices and earnings, risk, and investment of IPO firms. I document that firms with higher relative prices generate better earnings, have higher betas, and report larger capital expenditures than do issuers with lower relative prices.

4.1. Earnings

The finding of a positive relationship between relative prices and stock returns discussed earlier is quite striking: the difference between the abnormal returns (AR_{SzBM}) of top and bottom relative price quintiles is over 32% in the first three years following the IPO. This persistent outperformance by the firms with high relative prices may sustainable in the long run if these companies indeed gen-

erate better operating results than do their peers with lower relative prices. In this section, I present evidence documenting a positive link between relative prices and firms' profitability following the issue.

I obtain accounting data from the COMPUSTAT quarterly files. In particular, for each issue and each non-overlapping 4-quarter period following the IPO, I calculate profitability as return on assets, defined as the ratio of operating income to total assets.

Figure 6 presents average profitability of each of the five relative price quintiles during five years following the IPO. It is doubtless that firms with higher relative prices report better profitability numbers than do firms with lower measures. For instance, return on assets for the top quintile averages around 2.7% during five years after the issue while a comparable figure for the bottom group is just 0.4%. The difference in profitability is remarkably consistent: during each of the years considered, the firms with the highest relative prices outperform those with the low values. In unreported results, I also find that the ratio of net income to assets is negative during each of the five years following the IPO for all but the top relative price group.

These finding are consistent with the observations of Jain and Kini (1994) and Mikkelson et al. (1997) who document poor post-IPO accounting performance of the newly listed firms, but the results of this paper point out that the low profitability is concentrated in the issues with low relative prices.

4.2. Risk and Investment

What enables firms with higher relative prices to report higher measures of profitability than those of the firms with lower prices? One possibility is that they choose a higher offer price to signal their better growth prospects. If that is indeed the case, we should observe that these firms have a higher level of risk, as is suggested by the real options literature (e.g. Carlson, Fisher, and Giammarino (2004)). As the firms exercise their growth options, the level of risk should gradually decline. Furthermore, we should observe that firms with high relative prices are involved in considerably

more investment activities following the issue. This section confirms all of these hypotheses.

One simple proxy for a firm's growth options is its beta. For a company with better growth options, we should expect to observe a higher beta, and should expect this measure of risk to decline as the firm exercises the options. To check this conjecture, for each IPO I estimate betas as the sum of slope coefficients from regressing stock excess returns on market excess return, its lag and lead (Dimson (1979)). I use daily data to estimate betas in each non-overlapping 6-month period starting two weeks after the issue, where a month is defined to be a 21-day interval.

Figure 7 presents the average betas of the five relative price quintiles during five years following the IPO. Consistent with the hypothesis outlined above, firms with higher relative prices have considerably higher loadings. For example, in the first six months following the issue, average beta of the stocks in the top group is 2.00 while a comparable value for the bottom quintile is just 1.21. In no period during the first five years following the issue does the average beta of the bottom group exceed that of the top quintile. Moreover, consistent with the exercise of the growth options, average loadings of the quintiles with high relative prices decline noticeably during the first three to five years after the IPO. For instance, average beta of the top quintile falls from 2.00 in the first six months to 1.76 after three years, and to 1.70 in five years after the issue. The comparable numbers for the fourth quintile exhibit a similar pattern (1.81, 1.56, 1.55). It is possible that part of the decline is attributable to reduction of uncertainty surrounding the issue, but if that alone explained the beta dynamics, we should have observed a similar declining pattern in the loadings of the bottom quintile. Quite on the contrary, average betas of the firms with the lowest relative prices stay flat during the first five years, rising marginally from 1.20 to 1.24.

Empirical evidence discussed in this and previous Sections points out that firms with higher relative prices may have stronger growth prospects. To further explore this conjecture, I examine the average investment of the firms in each relative price quintile. Using the COMPUSTAT quarterly files, for each issue and each non-overlapping 4-quarter period following the IPO, I calculate investment as capital expenditures scaled by total assets. Average investment of each quintile in

the first five years following the issue is presented in Figure 8. While capital expenditures of the lowest quintile exceed those of the firms in the highest group in the first year, investment by the issuers with the highest relative prices are clearly larger in each successive year. Over the course of the five years examined, capital expenditures of each group decline, but average investment by the firms in the top quintile surpasses that of the other groups.

5. Why Should Relative Prices Matter?

The empirical findings discussed in the previous two sections are intriguing: it is not obvious why the price a firm chooses for its IPO should be related to underpricing, future returns and alphas, risk, as well as post-issuance profitability and investment. In this Section, I outline several possible explanations of the empirical results of this paper and discuss arguments calling into question the completeness of these explanations.

5.1. Price as Cheap Talk

The empirical findings of this article can be related to a recent work by Almazan et al. (2008) who develop a model in which information disclosed by the manager attracts attention and directs market research. Setting a high stock price may thus be a form of managerial cheap talk that increases research activities by market participants. Firms with poorer prospects may thus refrain from pricing their issues highly to avoid attracting much attention to their firm. However, firms with better growth opportunities will set a high price to induce increased interest in their firm. Market participants study the higher-priced firms and learn their true growth prospects, which becomes reflected in the increasing returns of the higher-priced issues.

This conjecture implies that we should observe that more analysts are following IPO stocks with higher relative prices. To the best of my knowledge, finance and accounting literature that explores the determinants of analyst coverage (e.g. Barth et al. (2001), Bhushan (1989)) has so far not studied the link between the number of analysts following the firm and the level of stock

price. Clearly, more analysts follow larger companies, and larger companies tend to have higher-priced shares. It is thus natural to suppose that analysts prefer to cover more expensive stocks. Nevertheless, conditional on size of the company, it is not clear whether analysts prefer to cover cheap or expensive shares.

I obtain the number of analysts following each IPO stock within one 365 days of issuance from the Institutional Brokers' Estimate System (IBES). Each calendar year, I sort IPO stocks into deciles based on their market capitalization immediately following the issue, and then, within each size decile, assign them into relative price tertiles. For each year, I divide the number analysts following stocks in each particular size-price group by the number of analysts covering all stocks in a particular size decile. The results in Panel A of Table 12 are averages across all years from 1986 to 2006 and clearly show that when it comes to IPO stocks, more analysts choose to cover stocks with higher share prices.[16] This finding is consistent with high price serving as a form of cheap talk to attract analyst attention. Controlling for other variables in the regression analysis of Panel B confirms this message.

It therefore seems possible that high relative price can attract analyst attention, but price as a cheap talk explanation of the findings of this paper is not entirely sound for at least two reasons. Firstly, learning about firm's prospects has to be very slow to justify five years of post-IPO outperformance by the stocks with high prices. Secondly, firms with poorer prospects may have an incentive to mimic actions of firms with better opportunities and set high prices for their issues. It thus seems sensible to conjecture that if a high-price firm reports low earnings, its stock price should drop significantly more than that of a cheaper issue reporting comparable results, as market participants may incur that the high-price firm is of lower quality than they originally believed. In unreported preliminary work, however, I condition returns around earnings announcement on relative price and earnings quality and find no difference between market reaction to poor results of either low- or high-priced IPOs.

[16]This finding is particularly interesting in light of the observation that for *all* stocks (i.e. IPO and non-IPO), conditional on size of the firm, more analysts follow *lower*-priced shares, which is what I find in unreported results.

5.2. Price as a Proxy for Delisting Risk

High offer price may be viewed as a signal of high delisting risk. Low price, on the other hand, may serve as an indicator that the managers are not concerned about prices going down in the future. Firms with high delisting risk are forced to set high prices because otherwise the likelihood of them delisting and incurring high costs for both the firm and the managers is greatly increased. Firms with low delisting risk, on the other hand, signal their quality by setting low prices.

This reasoning could possibly explain the differences in post-IPO returns of both types of firms. Yet it is not entirely satisfactory for two reasons. Firstly, if higher-priced stocks had higher delisting risk, one would expect to observe that the returns of these stocks exhibit higher volatility or have lower measures of skewness than do IPOs with lower prices. However, in unreported results, I find that firms with high relative prices actually have lower measures of volatility and only marginally lower skewness than stocks with low relative prices.

Secondly, and more importantly, prior research has shown that it is *low*-price stocks that are more likely to delist. For example, Seguin and Smoller (1997) find that cheap Nasdaq IPO stocks are more likely to end up in financial distress, and Fernando et al. (2004) observe that higher priced stocks are less likely to delist in the five years following the IPO. Price serving as a proxy for delisting risk thus also appears insufficient to explain the findings of this paper.

5.3. Price as a Signal of Quality

When Minivac 601, a digital computer kit, hit the shelves in 1961 at the price of $85, it was met with only mild demand. Its developer repainted the device from red and blue to black, renamed it Minivac 6010, and increased the price to $479, which significantly boosted the demand for the product. Similarly, Pepsi's market share rose after it abandoned the ads that focused on the product's relative cheapness, and Gin was not considered a preferred drink until increases of the excise duty brought its price closer to that of Whiskey.[17] These and numerous similar examples have been

[17]Examples like this are discussed in many sources. See, for instance, Chapter 11 in Gabor (1988).

interpreted as evidence supporting the notion that when characteristics of a good are not certain, price is often used as a proxy for the product's quality.

The research in marketing literature on the relationship between price and perceived quality is plentiful. Leavitt (1954) provided evidence showing that when price is the only differential information available, the buyer will select a higher-priced alternative. Stoetzel (1954) went a step further and pointed out that even in a situation when the consumer is well-informed about the quality of the product, he or she may often opt for a more expensive item.[18] Later research showed that in many cases even when the quality of goods is perceived by experts to be similar, consumers may still prefer a higher-priced alternative (see, e.g. Maynes and Assum (1982)). In their recent work, Prassmann et al. (2008) measured brain activity and concluded that when people are told a wine is expensive while they are drinking it, they really do think it tastes better than a cheap one.

Certainly, price is not the only piece of information available when the firm is going public. Yet, there is a lot of uncertainty surrounding the prospects of the firm. Given this high degree of uncertainty, it is no surprise that in making their investment decisions, people may rely on mental shortcuts developed throughout their lives, with one them being the positive link between perceived quality and relative prices.

Such mental shortcuts can explain the differences in the levels of underpricing observed for the firms with different relative prices. The demand for the more expensive IPO stocks is clearly higher, as is evidenced by the significantly larger level of underpricing of such issues. A behavioural argument may also help explain the positive relationship between relative prices and post-IPO stock performance: as investors observe high demand for the higher-priced issues and a rising price, they may infer that the quality of the issuing firm is indeed high and bid up the price of the shares even further.

Although it is hard to deny the human tendency to associate higher prices with better qual-

[18] One possible explanation for this human tendency can be related to what is known as Veblen principle, which argues that the reason for such unnecessary spending may be simply to impress others. Stoetzel and his followers, however, motivated their findings by risk aversion of the consumers, the risk referring to a possibility that the cheaper product will not properly satisfy their demand.

ity, especially in absence of complete information about the product, this explanation relies on behavioural assumptions that are not entirely satisfactory. While it may provide a partial explanation of differences in the levels of underpricing of the issues with different relative prices, it is hardly adequate to justify five years of post-IPO differences in returns that this paper documents. Even if one accepts that high returns of the expensive issues relate at least in part to certain human biases, it is hard to make the same argument for high profitability of firms with high relative prices. In other words, investors may tend to associate high offer price with better quality and bid up the prices of such issues even higher, driving up the returns; but earnings should not be affected by perceptions of the investors, and the finding of a positive relationship between profitability and prices remains puzzling.

6. Stock Splits and Relative Prices

The firms can significantly affect the level of their stock price in only two situations: when going public, and when splitting their shares. Earlier in the paper, we explored the former case, and in this Section I apply the methodology outlined above to study the relationship between the choice of price by the firm splitting its shares and post-split stock performance. The empirical results I obtain are remarkably similar to those described for IPOs: firms that choose higher relative prices when they split their shares generate significantly higher raw and abnormal returns following the split.

6.1. Data

From the CRSP files, I obtain all 2-for-1 stock split declaration dates from 1950 to 2006.[19] The sample includes $6,941$ events. I then follow the methodology outline in Section 3.1 of the paper: in the same manner as was done for IPOs, I obtain relative prices for each split. To exclude the announcement effect of stock split, market equity is computed as of one week prior to the

[19]There are few stock splits prior to 1950, so to facilitate the analysis, I exclude earlier data.

declaration date. Calculation of buy-and-hold raw as well as abnormal returns and alphas mimics the methodology used in the study of IPOs.

6.2. Results

Table 13 presents average raw and abnormal returns (Panels A through C) as well as market, 3-, and 4- factor model alphas (Panels D though F) for each relative price quintile of the splitting firms and 3-, 6-, 9- month as well as 1-, 2-, and 3-year holding periods. All numbers reported below are in percent.

The average returns for holding horizons of up to one year exhibit a pattern quite similar to that observed for post-IPO returns: raw and abnormal returns following the split tend to rise monotonically as relative prices increase. For instance, average one-year buy-and-hold return for stocks with the lowest relative prices is 10.88, while for the firms in the middle group this number is 16.62, and rises to 20.21 for the stocks in the top quintile. Abnormal returns follow a similar pattern, increasing from just 1.17 to 6.07 and up to 10.81 when matching by size, and rising from -0.37 to 6.74, up to 11.74 when matching by size and industry.[20]

Regardless of the measurement method, alphas also relate positively to relative prices. Market model alphas calculated using one-year horizon regressions increase from 0.41 per month for the stock with the lowest relative prices to 0.65 for the quintile of most expensive shares. Similarly, 3-factor model alphas increase from 0.51 to 0.88, while 4-factor alphas rise from 0.48 to 0.85.

At time horizons longer than one year, the relationship between post-split returns and relative prices is weaker. For instance, Panel D shows that at a 3-year holding horizon, the quintile of stocks with the lowest relative prices returns -8.79, while the middle group yields 9.57 and the top quintile generates -4.80. Still, at each time horizon considered, stocks in the top quintile consistently outperform those in the bottom group.

[20] Just as is the case with IPOs, it appears that these results are driven by *relative*, and not raw prices. In unreported results, I find that the relationship between raw prices and post-split performance is weak or absent depending on the holding horizon.

Interestingly, while the relationship between post-split returns and relative prices loses its monotonicity at horizons of 2 and 3 years, average alphas (regardless of the measurement method) consistently rise as relative prices increase. For example, 4-factor alphas from 3-year horizon regressions rise from -0.50 for the bottom group to -0.20 for the middle quintile, to -0.07 for the relatively most expensive shares. Numbers for the 3-factor and market models exhibit a similar pattern: -0.54 to -0.26 to -0.10 for the former, and -0.66 to -0.31 to -0.31 for the latter.

7. Conclusion

This paper explores the determinants of the firm's price choice at its initial public offering, and evaluates the relationship between this choice and underpricing, post-IPO stock returns, as well as firm risk, investment, and profitability.

I study the determinants of IPO prices and find that they relate significantly positively to median industry prices, underwriter reputation, and book-to-market ratio of the firm going public. I further document a strong positive relationship between relative offer prices of IPO firms and their post-issuance raw and abnormal stock returns. Firms with high relative prices outperform those with low values by as much as 32% in the first three years after going public. Unlike most new issues, firms in the highest relative price group do not underperform their matches. I further present evidence of strong positive relationship between offer prices and market, as well as 3- and 4-factor model alphas. Average monthly 4-factor alpha of the group of stocks with the highest relative prices is -1.09% during the 3-year period following the IPO while the comparable value for issues with low prices is -1.79%. Confirming these findings, this paper shows that relative price is a significant predictor of post-IPO raw and abnormal stock returns and alphas even after controlling for size and book-to-market of the issuer and rating of the underwriter. I further document that underpricing increases with relative offer prices: while stocks in the bottom relative price quintile are underpriced on average by 12.8%, those in the top group rise by 25.6% on the first day of trading.

This paper also explores whether firms' characteristics are related to the choice of the offer price. I show that firms with high relative prices have larger market betas, report considerably higher capital expenditures following the issue, and further observe that their betas gradually decline following the IPO. I also document a positive relationship between relative prices and profitability of the firms during the first five years after the issue.

Finally, this article shows that stock performance of the firms undergoing a 2-for-1 split exhibits a similar pattern to that of IPOs: raw and abnormal returns, as well as market, 3-, and 4-factor model alphas are strongly positively related to the relative prices of the splitting stocks.

The empirical results of this paper are very intriguing: aside from regulatory requirements, the firm going public is free to choose almost any price level for its shares. I explore three explanations for the findings – price as a form of cheap talk to attract attention of market participants, price as a proxy for delisting risk, and price as a signal of firm's prospects – but do not find either argument entirely satisfactory. A unified framework that is capable of explaining the empirical regularities documented in this paper would be very appealing, and is the subject of future work.

References

[1] Almazan, A., S. Banerji, and A. De Motta, 2008, Attracting attention: Cheap managerial talk and costly market monitoring, *Journal of Finance* 63, 1399-1436.

[2] Angel, J., 1997, Tick size, share prices and stock splits, *Journal of Finance* 52, 655-681.

[3] Anshuman, R., and A. Kalay, 2002, Can splits create market liquidity? Theory and evidence, *Journal of Financial Markets* 5, 83-125.

[4] Barth , M.E., Kasznik, R., and M.F. McNichols, 2001, Analyst coverage and intangible assets, *Journal of Accounting Research* 39, 1-34.

[5] Bhushan, R., 1989, Firm characteristics and analyst following, *Journal of Accounting and Economics* 11, 255-274.

[6] Brav, A., and P.A. Gompers, 1997, Myth or reality? The long-run underperformance of initial public offerings: Evidence from venture and nonventure capital-backed companies, *Journal of Finance* 52, 1791-1821.

[7] Carhart, M.M., 1997, On persistence in mutual fund performance, *Journal of Finance* 52, 57-82.

[8] Carlson, M., A. Fisher, and R. Giammarino, 2004, Corporate investment and asset price dynamics: Implications for the cross-section of returns, *Journal of Finance* 59, 2577-2603.

[9] Carter, R.B., F.H. Dark, and A.K. Singh, 1998, Underwriter reputation, initial returns, and the long-run performance of IPO stocks, *Journal of Finance* 53, 285-311.

[10] Carter, R. and S. Manaster, Initial public offerings and underwriter reputation, *Journal of Finance* 45, 1045-1067.

[11] Dimson, E., 1979, Risk measurement when shares are subject to infrequent trading, *Journal of Financial Economics* 7, 197-226.

[12] Fama, E., and K. French, 1993, Common risk factors in the returns on stocks and bonds, *Journal of Financial Economics* 33, 3-56.

[13] Fernando, C.S, S. Krishnamurthy, and P.A. Spindt, 2004, Are share price levels informative? Evidence from the ownership, pricing, turnover and performance of IPO firms, *Journal of Financial Markets* 7, 377-403.

[14] Gabor, A., 1988, Pricing: Concepts and Methods for Effective Marketing, 2nd edition (Gower Publishing Company).

[15] Graham, B., D.L. Dodd, and S. Cottle, Security Analysis, 4th edition (McGraw-Hill Book Company).

[16] Ibbotson, R.G., 1975, Price performance of common stock new issues, *Journal of Financial Economics* 2, 235-272.

[17] Jain, B.A., and O. Kini, 1994, The post-issue operating performance of IPO firms, *Journal of Finance* 49, 1699-1726.

[18] Lakonishok, J., and B. Lev, 1987, Stock splits and stock dividends: Why, who, and when, *Journal of Finance* 42, 913-932.

[19] Leavitt, H.J., 1954, A note on some experimental findings about the meaning of price, *Journal of Business* 27, 205-210.

[20] Lipman, F.D., 2000, The Complete Going Public Handbook (Prima Publishing).

[21] Logue, D.E., 1973, On the pricing of unseasoned equity issues: 1965–1969, *Journal of Financial and Quantitative Analysis* 8, 91-103.

[22] Loughran, T., and J.R. Ritter, 1995, The new issues puzzle, *Journal of Finance* 50, 23-51.

[23] Loughran, T., and J.R. Ritter, 2004, Why has IPO underpricing changed over time, *Financial Management* 33, 5-37.

[24] Maynes, E.S., and T. Assum, 1982, Informationally imperfect consumer markets: Empirical findings and policy implications, *The Journal of Consumer Affairs*, 62-87.

[25] Mikkelson, W.H., M.M. Partch, and K. Shah, 1997, Ownership and operating performance of companies that go public, *Journal of Financial Economics* 44, 281-307.

[26] Muscarella C.J., and M.R. Vetsuypens, 1996, Stock splits: Signaling or liquidity? The case of ADR 'solo-splits', *Journal of Financial Economics* 42, 3-26.

[27] Prassmann et al., 2008, Marketing actions can modulate neural representations of experienced pleasantness, *Proceedings of the National Academy of Sciences* 105, 1050-1054.

[28] Purnanandam, A.K., and B. Swaminathan, 2002, Are IPOs underpriced, Working Paper, Cornell University.

[29] Reilly, F.K., 1973, Further evidence on short-run results for new issues investors, *Journal of Financial and Quantitative Analysis* 8, 83-90.

[30] Ritter, J.R., 1991, The long-run performance of initial public offerings, *Journal of Finance* 46, 3-27.

[31] Schultz, P.H., 2000, Stock splits, tick size and sponsorship, *Journal of Finance* 55, 429-450.

[32] Seguin, P., and M. Smoller, 1997, Share price and mortality: An empirical evaluation of newly listed Nasdaq stocks, *Journal of Financial Economics* 45, 333-364.

[33] Stoetzel, J., 1954, Les prix comme limite, *La Psychologie Économique* (Marcel Rivière et Cie.).

[34] Stoll, H.R., and A.J. Curley, 1970, Small business and the new issues market for equities, *Journal of Financial and Quantitative Analysis* 5, 309-322.

Table 1. Determinants of IPO Prices

	Shares Issued	Rank of Underwriter	Median Industry Price	Relative Price Runup	BM Ratio	R^2
			A. Offer Price			
(1)	0.049					21.46
	[7.03]					
(2)	0.031	1.210				41.21
	[5.15]	[41.65]				
(3)	0.026	1.199	0.136			42.40
	[4.30]	[41.68]	[10.40]			
(4)	0.031	1.199		2.641		41.63
	[5.15]	[41.35]		[6.20]		
(5)	0.026	1.192	0.125	1.883		42.60
	[4.37]	[41.46]	[9.41]	[4.38]		
(6)	0.025	1.193	0.124	2.006	0.202	42.82
	[4.21]	[41.56]	[9.34]	[4.67]	[4.56]	
			B. Midpoint of Filing Range			
(1)	0.048					8.90
	[4.15]					
(2)	0.032	1.060				15.39
	[2.88]	[19.92]				
(3)	0.029	1.054	0.086			15.58
	[2.57]	[19.80]	[3.54]			
(4)	0.032	1.057		0.776		15.39
	[2.88]	[19.83]		[0.99]		
(5)	0.029	1.053	0.084	0.264		15.57
	[2.58]	[19.76]	[3.42]	[0.33]		
(6)	0.027	1.054	0.082	0.546	0.459	16.07
	[2.38]	[19.84]	[3.32]	[0.69]	[5.62]	

Notes: This table reports coefficients, t-statistics, and adjusted R^2 from regressing IPO offer prices (in Panel A) and midpoints of the filing range (in Panel B) on the following explanatory variables: number of shares issued at the IPO; underwriter reputation rank as in Carter and Manaster (1990); median price of firms in the same industry into which the IPO stock is entering, calculated one week prior to issuance; difference between 12-month log returns of value-weighted industry and market portfolios; and log of book-to-market ratio, which is based on the book equity value from SDC and the market value as of the end of the first trading day. If SDC book data is not available book equity is taken as the first observation from COMPUSTAT files given that it is within one year of the issuance date. Industry assignments are based on 49 industry classifications suggested by Kenneth French. Regressions include year dummies and NYSE dummy, which is set to 1 if the IPO is listing on the New York Stock Exchange and to 0 otherwise. The sample period is 1986-2006.

Table 2. Stock Prices in Selected Industries

	IPO Firms			Already Listed Firms		
Industry	Average	Median	N	Average	Median	N
Precious Metals	-	-	0	10.41	4.27	58
Pharmaceutical Products	9.98	9.00	23	14.91	7.75	348
Medical Equipment	8.80	8.00	10	20.05	12.12	172
Business Services	13.40	14.25	10	19.67	12.90	377
Trading	17.10	15.00	17	26.61	16.13	1,226
Petroleum and Natural Gas	17.56	17.00	8	33.72	30.79	210
Tobacco Products	-	-	0	49.64	52.60	8

Notes: This table reports average and median prices for the companies that went public in selected industries in 2006. It also presents the mean and median prices for all firms in these industries as of the end of 2005. Industry assignments are based on 49 industry classifications suggested by Kenneth French. N is the number of firms.

Table 3. Raw and Abnormal Returns

	Low	Quintile 2	Quintile 3	Quintile 4	High
			A. Raw Returns		
3 month	4.42	4.34	5.90	7.00	6.64
6 month	2.77	4.42	7.21	7.33	6.53
9 month	3.38	3.49	9.08	8.55	10.01
1 year	2.08	2.15	9.88	9.19	11.23
2 year	10.14	8.16	27.03	24.47	28.70
3 year	26.27	19.47	42.10	45.38	40.48
4 year	51.52	43.83	58.24	62.21	64.76
5 year	53.80	61.79	73.42	78.66	114.68
			B. Abnormal Returns, in Excess of Market, AR_{Mkt}		
3 month	1.69	1.61	3.00	4.21	3.74
6 month	-3.18	-1.70	1.25	1.46	0.60
9 month	-6.19	-6.23	-0.77	-0.98	0.14
1 year	-10.86	-10.63	-3.16	-3.47	-1.91
2 year	-18.78	-20.33	-1.80	-3.61	-0.50
3 year	-21.51	-27.38	-5.93	-1.96	-7.25
4 year	-16.05	-22.23	-10.13	-4.84	-3.13
5 year	-31.03	-23.00	-14.15	-8.16	29.00
			C. Abnormal Returns, Matching on Size, AR_{SzDec}		
3 month	2.05	2.03	3.47	4.45	4.04
6 month	-2.05	-0.67	2.42	2.60	1.80
9 month	-4.38	-4.57	0.83	0.61	1.93
1 year	-7.98	-8.03	-0.81	-0.82	0.92
2 year	-13.23	-15.16	3.67	1.73	5.85
3 year	-11.53	-17.98	4.96	8.20	3.82
4 year	-5.79	-11.00	1.77	6.11	9.76
5 year	-21.39	-10.32	1.76	8.21	44.80
			D. Abnormal Returns, Matching on Size and Industry, AR_{SzInd}		
3 month	2.35	2.87	3.70	5.10	4.13
6 month	-1.36	0.08	2.65	2.47	2.67
9 month	-3.77	-3.68	0.89	1.16	4.48
1 year	-6.63	-6.44	-0.13	0.95	2.61
2 year	-13.75	-15.70	4.40	3.65	2.76
3 year	-9.19	-19.20	7.76	8.48	7.96
4 year	-4.81	-14.67	-6.50	-5.56	3.69
5 year	-52.74	-9.11	-3.01	-19.09	39.91
			E. Abnormal Returns, Matching on Size and BM, AR_{SzBM}		
3 month	1.18	0.14	2.99	3.47	3.69
6 month	-1.49	-0.81	4.76	3.26	2.90
9 month	-5.58	-3.07	3.09	1.23	3.63
1 year	-9.28	-6.86	0.54	-0.18	3.51
2 year	-17.68	-14.92	0.50	4.30	7.70
3 year	-23.48	-22.60	2.00	9.91	8.77
4 year	-23.42	-20.61	-2.16	4.06	11.70
5 year	-34.29	-22.75	-6.73	-3.51	28.07

Notes: This table reports average raw and abnormal buy-and-hold returns of the IPO stocks conditional on their relative offer prices. Assignment into relative price groups and calculation of abnormal returns are discussed in detail in Section 3.1. The sample period is 1986-2006.

Table 4. Alphas of Relative Price Quintiles

	Low	Quintile 2	Quintile 3	Quintile 4	High
			A. Market Model Alphas		
3 month	0.59	-0.25	0.30	0.33	0.47
6 month	-0.37	-0.67	-0.16	-0.36	-0.31
9 month	-0.36	-0.65	-0.11	-0.41	-0.18
1 year	-0.45	-0.78	-0.33	-0.44	-0.18
2 year	-1.94	-1.86	-1.49	-1.46	-1.30
3 year	-2.07	-1.95	-1.68	-1.60	-1.44
4 year	-1.87	-1.64	-1.52	-1.49	-1.43
5 year	-1.95	-1.65	-1.55	-1.54	-1.57
			B. 3-Factor Model Alphas		
3 month	0.41	-0.55	0.05	0.14	0.31
6 month	-0.30	-0.65	-0.05	-0.29	-0.24
9 month	-0.43	-0.66	-0.10	-0.47	-0.17
1 year	-0.38	-0.69	-0.29	-0.42	-0.11
2 year	-1.85	-1.75	-1.41	-1.36	-1.14
3 year	-1.99	-1.86	-1.57	-1.48	-1.28
4 year	-1.93	-1.68	-1.53	-1.48	-1.38
5 year	-1.95	-1.67	-1.58	-1.50	-1.50
			C. 4-Factor Model Alphas		
3 month	0.34	-0.51	0.14	0.14	0.35
6 month	-0.37	-0.67	-0.11	-0.36	-0.21
9 month	-0.45	-0.66	-0.15	-0.51	-0.16
1 year	-0.39	-0.70	-0.31	-0.45	-0.11
2 year	-1.81	-1.67	-1.38	-1.28	-1.09
3 year	-1.79	-1.65	-1.38	-1.26	-1.09
4 year	-1.79	-1.53	-1.39	-1.35	-1.24
5 year	-1.85	-1.58	-1.49	-1.40	-1.38

Notes: This table reports average monthly market, 3-, and 4-factor model alphas, in percent, of the IPO stocks conditional on their relative offer prices. Details of assignment into relative price groups and estimation of alphas are discussed in Sections 3.1 and 3.2, respectively. The sample period is 1986-2006.

Table 5. Long-Term Performance of Relative Price Quintiles

	Low	Quintile 2	Quintile 3	Quintile 4	High	High–Low
			A. 1986–2001			
MEAN	0.21	0.49	0.72	0.64	1.28	1.06
T	0.42	0.87	1.26	1.16	2.31	4.45
STD	6.94	7.71	7.84	7.46	7.57	3.24
SKEW	-0.55	-0.49	-0.69	-0.78	-0.49	0.78
KURT	3.43	5.02	2.88	2.02	2.38	2.15
MIN	-28.46	-30.82	-30.99	-30.23	-32.13	-5.82
MAX	28.70	35.52	28.35	21.94	26.61	16.27
			B. 1986–1990			
MEAN	-0.53	-0.44	-0.23	-0.02	0.69	1.18
T	-0.65	-0.49	-0.23	-0.02	0.70	2.63
STD	6.00	6.70	7.56	7.72	7.31	3.33
SKEW	-2.11	-2.01	-1.17	-1.20	-1.49	0.45
KURT	7.95	7.06	4.43	3.45	6.64	0.61
MIN	-28.46	-30.80	-30.99	-30.23	-32.13	-5.82
MAX	7.85	10.30	18.40	16.56	17.97	10.21
			C. 1991–1996			
MEAN	1.08	1.36	1.81	1.48	1.91	0.83
T	2.19	2.80	3.19	2.62	2.90	2.36
STD	4.18	4.12	4.82	4.78	5.58	2.98
SKEW	-0.30	-0.07	-0.14	-0.19	-0.20	0.17
KURT	0.19	0.34	-0.28	-0.32	0.05	-0.34
MIN	-11.32	-9.97	-9.51	-11.16	-13.00	-4.64
MAX	11.69	11.12	12.59	12.05	15.28	8.20
			D. 1997–2001			
MEAN	-0.16	0.31	0.29	0.23	1.07	1.23
T	-0.12	0.21	0.21	0.18	0.84	2.69
STD	9.90	11.25	10.62	9.66	9.73	3.49
SKEW	-0.02	-0.01	-0.33	-0.40	-0.02	1.50
KURT	0.55	1.56	0.68	0.05	0.16	5.01
MIN	-22.94	-30.82	-26.26	-23.27	-23.85	-5.39
MAX	28.70	35.52	28.35	21.94	26.61	16.27

Notes: This table reports average return, in percent per month, the corresponding t-statistic, as well, as standard deviation, skewness, kurtosis, minimum, and maximum of a strategy that, on the first day of each calendar quarter, invests \$1 in each of the five relative price quintiles of the firms that went public in the preceding quarter. Investment in each stock is held without rebalancing for 60 months. Details of assignment into relative price groups are discussed in Section 3.1.

Table 6. Performance of High–Low Quintiles

	α	MKTRF	HML	SMB	UMD	R^2
(1)	1.06					
	4.45					
(2)	0.97	0.16				4.68
	4.13	3.17				
(3)	1.02	0.13	-0.1	-0.04		4.42
	4.26	2.12	-1.19	-0.75		
(4)	1.06	0.12	-0.11	-0.04	-0.03	4.21
	4.33	2.05	-1.27	-0.71	-0.77	

Notes: This table reports coefficients, t-statistics, and adjusted R^2 values from regressing monthly returns (in percent) from an investment strategy described below on market (MKTRF), value (HML), size (SMB), and momentum (UMD) factors. On the first day of each calendar quarter, the investment strategy calls for taking a long (short) position in highest (lowest) relative price quintile of the firms that went public in the preceding quarter. Initial investment of \$1 is held without rebalancing for 60 months. Details of assignment into relative price groups are discussed in Section 3.1.

Table 7. Long-Term Performance of Price and Industry Runup Quintiles

	Low	Quintile 2	Quintile 3	Quintile 4	High	High–Low
			A. Relative Price			
MEAN	0.21	0.49	0.72	0.64	1.28	1.06
T	0.42	0.87	1.26	1.16	2.31	4.45
STD	6.94	7.71	7.84	7.46	7.57	3.24
SKEW	-0.55	-0.49	-0.69	-0.78	-0.49	0.78
KURT	3.43	5.02	2.88	2.02	2.38	2.15
MIN	-28.46	-30.82	-30.99	-30.23	-32.13	-5.82
MAX	28.70	35.52	28.35	21.94	26.61	16.27
			B. Raw Price			
MEAN	0.50	0.56	0.78	0.73	0.86	0.36
T	0.75	0.94	1.42	1.42	2.00	1.04
STD	9.06	8.21	7.48	7.08	5.83	4.70
SKEW	-0.16	-0.59	-0.68	-0.89	-0.86	-0.63
KURT	3.56	2.81	3.05	3.10	2.80	5.83
MIN	-31.59	-33.22	-30.34	-32.10	-25.26	-24.90
MAX	41.65	29.77	27.36	21.50	17.30	18.41
			C. Inverse of Industry Price			
MEAN	0.46	0.47	0.69	0.87	0.87	0.43
T	1.12	0.99	1.15	1.43	1.41	1.39
STD	5.62	6.42	8.16	8.36	8.39	4.17
SKEW	-1.02	-0.94	-0.33	-0.41	-0.71	-0.32
KURT	3.73	4.39	3.25	2.66	1.91	2.34
MIN	-26.78	-28.10	-29.91	-34.52	-32.73	-19.61
MAX	17.73	22.53	34.84	33.66	24.80	10.62
			D. Industry Runup			
MEAN	0.76	0.45	0.73	0.67	0.59	-0.15
T	1.51	0.96	1.30	1.15	0.98	-0.58
STD	6.85	6.38	7.64	7.99	8.17	3.57
SKEW	-0.99	-1.07	-0.77	-0.24	0.02	2.11
KURT	3.25	2.55	2.64	3.71	4.07	12.18
MIN	-31.96	-28.11	-32.01	-31.15	-30.09	-11.58
MAX	18.79	14.46	24.29	35.03	39.90	21.11
			E. Industry Runup Relative to Market			
MEAN	0.63	0.66	0.59	0.69	0.60	-0.03
T	1.25	1.28	1.11	1.20	0.98	-0.12
STD	6.89	7.01	7.18	7.83	8.31	3.60
SKEW	-1.02	-0.74	-0.96	-0.32	0.11	2.79
KURT	3.12	2.23	2.81	3.53	4.27	16.27
MIN	-31.62	-29.02	-30.57	-31.91	-30.55	-9.45
MAX	19.19	22.46	21.38	32.70	40.17	24.12

Notes: This table reports average return, in percent per month, the corresponding t-statistic, as well, as standard deviation, skewness, kurtosis, minimum, and maximum of a strategy that, on the first day of each calendar quarter, invests \$1 in each of the five relative price (Panel A), raw price (Panel B), inverse of median industry price (Panel C), industry runup (Panel D), or industry runup relative to market (Panel E) quintiles of the firms that went public in the preceding quarter. Investment in each stock is held without rebalancing for 60 months. Industry runup is defined to be 12-month compounded industry return ending in the month prior to the issuance month. Relative industry runup is defined as the difference in 12-month log returns of value-weighted industry portfolio from Kenneth French's website and value-weighted market return from CRSP. Details of assignment into are discussed in Sections 3.1 and 3.3.

Table 8. Abnormal Returns of Price and Industry Runup Quintiles

	Low	Quintile 2	Quintile 3	Quintile 4	High
			A. Relative Price		
6 month	-1.49	-0.81	4.76	3.26	2.90
1 year	-9.28	-6.86	0.54	-0.18	3.51
3 year	-23.48	-22.60	2.00	9.91	8.77
5 year	-34.29	-22.75	-6.73	-3.51	28.07
			B. Raw Price		
6 month	4.47	2.77	2.95	-0.79	-0.26
1 year	-3.84	-2.57	-1.30	-3.12	-1.13
3 year	-3.85	-8.52	-13.46	-7.84	11.26
5 year	-14.51	-23.13	-16.46	3.84	13.65
			C. Inverse of Industry Price		
6 month	-2.31	-2.43	0.10	5.40	4.31
1 year	-7.74	-9.92	-3.43	0.73	-0.43
3 year	-21.34	-19.44	-6.71	-3.44	7.76
5 year	-25.63	-28.63	-13.68	1.09	-4.21
			D. Industry Runup		
6 month	1.01	0.74	3.25	2.25	1.90
1 year	-1.35	-2.70	-1.77	-4.42	-1.49
3 year	0.25	-10.07	1.36	-9.67	-8.88
5 year	-6.92	-20.02	2.16	-20.14	-11.54
			E. Industry Runup Relative to Market		
6 month	0.41	2.65	1.03	3.39	1.52
1 year	-2.18	-0.51	-3.63	-4.30	-1.30
3 year	-4.03	-3.83	2.46	-13.37	-8.75
5 year	-13.63	-9.26	-1.83	-22.93	-9.69

Notes: This table reports average raw and abnormal buy-and-hold returns of the IPO stocks conditional on their relative offer prices (Panel A), raw price (Panel B), inverse of median industry price (Panel C), industry runup (Panel D), or industry runup relative to market (Panel E). Industry runup is defined to be 12-month compounded industry return ending in the month prior to the issuance month. Relative industry runup is defined as the difference in 12-month log returns of value-weighted industry portfolio from Kenneth French's website and value-weighted market return from CRSP. Details of assignment into relative price groups and calculation of abnormal returns are discussed in detail in Sections 3.1 and 3.3. The sample period is 1986-2006.

Table 9. UNDERPRICING

Relative Price Quintile	First-Day Return
Low	12.82
2	12.15
3	13.14
4	18.39
High	25.60
All	16.39

Notes: This table reports average levels of underpricing of IPO stocks in different relative price quintiles. Underpricing is calculated as the return during the first trading day. Details of assignment into relative price groups are discussed in Section 3.1. The row labeled 'All' does not condition on the relative price. Numbers are in percent. The sample period is 1986-2006.

Table 10. Forecasting Post-IPO Stock Returns

	1 year					3 year					5 year				
Reg	RelPr	ME	BM	UW	R^2	RelPr	ME	BM	UW	R^2	RelPr	ME	BM	UW	R^2
						A. Raw Returns									
(1)	0.079				4.369	0.216				2.303	0.311				2.616
	[4.91]					[4.42]					[3.55]				
(2)	0.061	0.023			4.459	0.212	0.005			2.275	0.331	-0.028			2.586
	[3.41]	[2.28]				[3.91]	[0.17]				[3.44]	[0.49]			
(3)	0.048	0.031	0.024		4.790	0.191	0.019	0.034		2.352	0.252	0.021	0.099		2.944
	[2.66]	[3.02]	[4.08]			[3.46]	[0.58]	[1.91]			[2.55]	[0.35]	[3.16]		
(4)	0.037	0.003	0.022	0.026	5.097	0.168	-0.050	0.030	0.066	2.609	0.226	-0.057	0.095	0.079	3.068
	[2.04]	[0.27]	[3.66]	[3.94]		[3.02]	[1.27]	[1.64]	[3.14]		[2.26]	[0.80]	[3.04]	[2.03]	
						B. Abnormal Returns, in Excess of Market, AR_{Mkt}									
(1)	0.079				2.549	0.216				1.390	0.309				1.917
	[5.02]					[4.43]					[3.53]				
(2)	0.057	0.029			2.708	0.207	0.012			1.365	0.323	-0.021			1.881
	[3.24]	[2.89]				[3.83]	[0.39]				[3.37]	[0.36]			
(3)	0.045	0.037	0.023		3.028	0.186	0.026	0.034		1.440	0.243	0.030	0.101		2.263
	[2.51]	[3.59]	[3.98]			[3.38]	[0.79]	[1.88]			[2.45]	[0.50]	[3.24]		
(4)	0.035	0.011	0.021	0.024	3.298	0.163	-0.043	0.029	0.067	1.703	0.216	-0.049	0.097	0.079	2.392
	[1.93]	[0.89]	[3.58]	[3.68]		[2.94]	[1.11]	[1.61]	[3.16]		[2.17]	[0.69]	[3.11]	[2.05]	
						C. Abnormal Returns, Matching on Size, AR_{SzDec}									
(1)	0.075				1.608	0.211				0.801	0.322				1.402
	[4.80]					[4.34]					[3.67]				
(2)	0.051	0.031			1.795	0.202	0.013			0.776	0.318	0.005			1.362
	[2.95]	[3.09]				[3.74]	[0.41]				[3.31]	[0.09]			
(3)	0.039	0.038	0.023		2.133	0.181	0.027	0.034		0.854	0.238	0.056	0.102		1.747
	[2.21]	[3.81]	[4.06]			[3.28]	[0.82]	[1.91]			[2.40]	[0.93]	[3.24]		
(4)	0.030	0.014	0.021	0.023	2.387	0.159	-0.040	0.030	0.064	1.100	0.211	-0.024	0.098	0.080	1.880
	[1.66]	[1.14]	[3.68]	[3.56]		[2.86]	[1.03]	[1.65]	[3.05]		[2.11]	[0.33]	[3.12]	[2.07]	
						D. Abnormal Returns, Matching on Size and Industry, AR_{SzInd}									
(1)	0.066				0.385	0.255				0.429	0.420				0.036
	[3.28]					[4.18]					[2.80]				
(2)	0.042	0.030			0.491	0.248	0.010			0.401	0.404	0.023			-0.004
	[1.90]	[2.39]				[3.66]	[0.25]				[2.46]	[0.23]			
(3)	0.030	0.038	0.023		0.691	0.230	0.022	0.029		0.422	0.338	0.064	0.084		0.058
	[1.33]	[2.94]	[3.15]			[3.33]	[0.53]	[1.29]			[1.99]	[0.63]	[1.57]		
(4)	0.022	0.018	0.022	0.019	0.788	0.214	-0.026	0.026	0.046	0.483	0.338	0.064	0.084	0.000	0.016
	[0.97]	[1.13]	[2.90]	[2.31]		[3.08]	[0.53]	[1.15]	[1.74]		[1.98]	[0.53]	[1.57]	[0.00]	
						E. Abnormal Returns, Matching on Size and BM, AR_{SzBM}									
(1)	0.084				3.845	0.245				2.156	0.309				2.407
	[5.51]					[6.19]					[5.79]				
(2)	0.062	0.029			4.010	0.216	0.037			2.180	0.274	0.046			2.424
	[3.65]	[3.01]				[4.92]	[1.48]				[4.62]	[1.35]			
(3)	0.050	0.036	0.023		4.338	0.195	0.050	0.042		2.333	0.221	0.078	0.102		2.967
	[2.91]	[3.72]	[4.13]			[4.37]	[1.98]	[2.88]			[3.69]	[2.29]	[5.22]		
(4)	0.040	0.012	0.021	0.023	4.594	0.162	-0.036	0.034	0.081	2.826	0.182	-0.024	0.093	0.095	3.340
	[2.33]	[0.99]	[3.72]	[3.68]		[3.59]	[1.17]	[2.34]	[4.97]		[3.00]	[0.57]	[4.73]	[4.36]	

Notes: This table reports slope coefficients, t-statistics, and the adjusted R^2 values (in percent) from regressing raw and abnormal returns of the IPO stocks on relative price (RelPr), log of market equity (ME), log of book-to-market (BM), underwriter rank (UW), and year dummies. Calculation of relative prices and raw and abnormal returns are detailed in Section 3.1. The sample period is 1986-2006.

Table 11. Forecasting Post-IPO Alphas

	1 year					3 year					5 year				
Reg	RelPr	ME	BM	UW	R^2	RelPr	ME	BM	UW	R^2	RelPr	ME	BM	UW	R^2
						A. Market Model Alpha									
(1)	0.001				2.503	0.003				6.954	0.002				9.409
	[1.17]					[4.15]					[3.89]				
(2)	0.003	-0.002			2.730	0.003	0.001			6.972	0.002	0.001			9.453
	[2.55]	[3.42]				[3.13]	[1.35]				[2.68]	[1.74]			
(3)	0.002	-0.002	0.002		3.030	0.002	0.001	0.001		7.196	0.002	0.001	0.001		9.559
	[1.86]	[2.65]	[3.89]			[2.46]	[1.96]	[3.37]			[2.15]	[2.19]	[2.42]		
(4)	0.002	-0.003	0.001	0.001	3.075	0.002	0.000	0.001	0.001	7.495	0.001	0.000	0.000	0.001	9.954
	[1.57]	[3.19]	[3.69]	[1.78]		[1.88]	[0.60]	[2.93]	[3.86]		[1.49]	[0.72]	[1.95]	[4.40]	
						B. 3-Factor Model Alpha									
(1)	0.002				3.050	0.004				3.553	0.003				4.421
	[1.72]					[4.59]					[4.41]				
(2)	0.003	-0.001			3.107	0.003	0.001			3.606	0.002	0.000			4.430
	[2.39]	[1.92]				[3.30]	[1.84]				[3.40]	[1.17]			
(3)	0.002	-0.001	0.001		3.282	0.003	0.001	0.001		3.708	0.002	0.001	0.001		4.515
	[1.84]	[1.33]	[3.05]			[2.81]	[2.25]	[2.35]			[2.90]	[1.58]	[2.17]		
(4)	0.002	-0.002	0.001	0.001	3.348	0.002	0.000	0.001	0.001	3.983	0.002	0.000	0.000	0.001	4.753
	[1.51]	[2.25]	[2.82]	[2.04]		[2.26]	[0.24]	[1.94]	[3.65]		[2.38]	[0.64]	[1.80]	[3.39]	
						C. 4-Factor Model Alpha									
(1)	0.002				2.972	0.004				2.631	0.003				3.500
	[1.50]					[4.59]					[4.49]				
(2)	0.003	-0.001			3.028	0.003	0.001			2.690	0.002	0.001			3.524
	[2.19]	[1.91]				[3.27]	[1.90]				[3.36]	[1.43]			
(3)	0.002	-0.001	0.001		3.202	0.003	0.001	0.001		2.794	0.002	0.001	0.000		3.596
	[1.64]	[1.32]	[3.04]			[2.79]	[2.31]	[2.36]			[2.89]	[1.80]	[2.03]		
(4)	0.002	-0.002	0.001	0.001	3.251	0.002	0.000	0.001	0.001	3.149	0.002	0.000	0.000	0.001	3.841
	[1.35]	[2.12]	[2.83]	[1.82]		[2.17]	[0.45]	[1.90]	[4.09]		[2.37]	[0.47]	[1.66]	[3.42]	

Notes: This table reports slope coefficients, t-statistics, and the adjusted R^2 values (in percent) from regressing market, 3-, and 4-factor model alphas of the IPO stocks on relative price (RelPr), log of market equity (ME), log of book-to-market (BM), underwriter rank (UW), and year dummies. Calculation of relative prices and alphas are detailed in Section 3.1 and Table 4. The sample period is 1986-2006.

Table 12. Offer Prices and Analyst Following of IPO Stocks

A. Double-Sort on Size and Relative Price

	Relative Price		
ME decile	Low	Med	High
Small	0.29	0.32	0.39
2	0.24	0.32	0.44
3	0.32	0.30	0.38
4	0.29	0.28	0.44
5	0.29	0.33	0.39
6	0.31	0.26	0.43
7	0.23	0.34	0.42
8	0.25	0.34	0.41
9	0.23	0.35	0.42
Big	0.22	0.35	0.43

B. Regression Analysis

	relPrc	ME	BM	UW	R^2
(1)	1.846				27.47
	[31.1]				
(2)	0.847	1.650			45.01
	[14.9]	[42.2]			
(3)	0.630	1.853	0.593		49.47
	[11.4]	[48.0]	[22.2]		
(4)	0.614	1.765	0.586	0.075	49.54
	[11.1]	[36.8]	[21.9]	[3.1]	

Notes: This table reports average fraction of analysts covering IPO stocks conditional on size and relative price (Panel A). It further gives in Panel B the coefficients, t-statistics, and adjusted R^2 values of regressing the number of analysts following the IPO stock on relative price (relPrc), log of market equity (ME), log of book-to-market (BM), underwriter rank (UW), and year dummies. Calculation of relative prices are detailed in Section 3.1, and assignment into relative price-size groups is discussed in Section 5.1. The sample period is 1986-2006.

Table 13. Returns and Alphas Following Stock Splits

	Low	Quintile 2	Quintile 3	Quintile 4	High
			A. Raw Returns		
3 month	5.91	6.11	5.64	6.51	8.12
6 month	7.84	10.50	9.42	11.91	10.99
9 month	11.32	13.01	12.86	15.31	16.23
1 year	10.88	16.26	16.62	18.64	20.21
2 year	20.43	28.53	28.01	28.37	27.82
3 year	33.48	40.07	47.31	42.36	41.11
			B. Abnormal Returns, Matching on Size, AR_{SzDec}		
3 month	3.67	3.42	3.35	4.53	5.86
6 month	3.21	5.51	4.60	7.18	6.74
9 month	3.82	5.19	5.07	7.72	9.25
1 year	1.17	5.42	6.07	8.34	10.81
2 year	-4.29	3.00	3.65	4.25	5.76
3 year	-8.82	-1.49	6.62	2.57	2.87
			C. Abnormal Returns, Matching on Size and Industry, AR_{SzInd}		
3 month	3.21	3.09	2.20	4.81	6.79
6 month	0.75	4.91	3.45	6.85	8.12
9 month	2.75	5.01	4.55	6.31	10.22
1 year	-0.37	5.00	6.73	6.74	11.74
2 year	-3.62	2.00	6.71	4.79	2.98
3 year	-8.79	-1.34	9.57	0.97	-4.80
			D. Market Model Alphas		
3 month	1.59	1.46	1.30	1.77	2.10
6 month	0.87	0.93	0.88	1.18	1.16
9 month	0.61	0.63	0.60	0.71	0.82
1 year	0.41	0.46	0.49	0.57	0.65
2 year	-0.49	-0.37	-0.21	-0.20	-0.22
3 year	-0.66	-0.57	-0.31	-0.39	-0.31
			E. 3-Factor Model Alphas		
3 month	1.79	1.43	1.48	1.96	2.32
6 month	0.89	0.99	0.98	1.38	1.44
9 month	0.65	0.69	0.68	0.83	0.98
1 year	0.51	0.52	0.61	0.74	0.88
2 year	-0.35	-0.28	-0.10	0.11	0.06
3 year	-0.54	-0.52	-0.26	-0.16	-0.10
			F. 4-Factor Model Alphas		
3 month	1.69	1.26	1.11	1.66	2.01
6 month	0.85	0.96	0.88	1.25	1.31
9 month	0.62	0.68	0.63	0.76	0.92
1 year	0.48	0.50	0.57	0.70	0.85
2 year	-0.35	-0.27	-0.13	0.09	0.02
3 year	-0.50	-0.46	-0.20	-0.11	-0.07

Notes: This table reports average raw and abnormal buy-and-hold returns as well as market, 3-, and 4-factor model alphas of following 2-for-1 stock splits, conditional on their relative offer prices. Assignment into relative price groups and calculation of abnormal returns and alphas are discussed in detail in Sections 3.1 and 3.2. The sample period is 1950-2006.

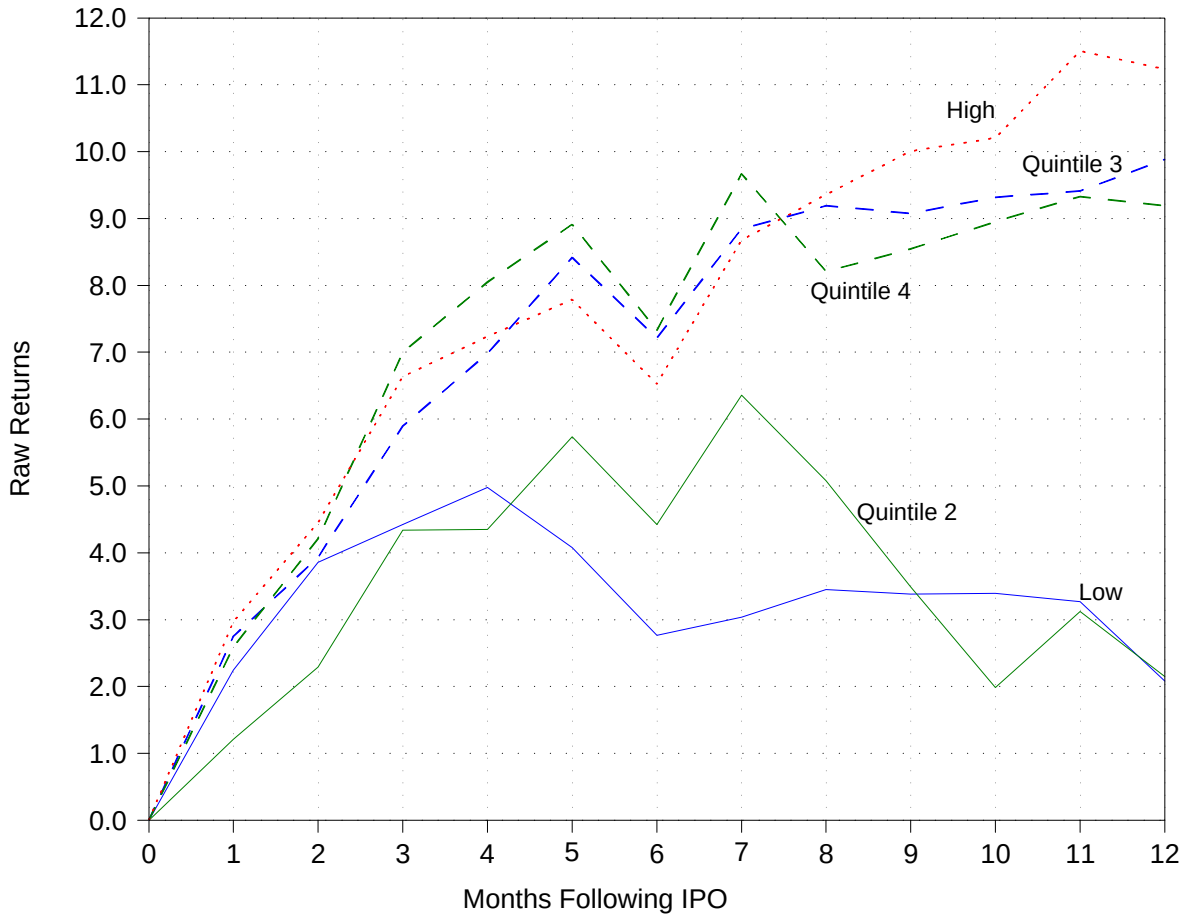

Figure 1. Raw Returns. This figure plots average raw buy-and-hold returns of the five relative price quintiles of the IPO stocks during the 12 months following the issue. Details of assignment into relative price groups are discussed in Section 3.1. The sample period is 1986-2006.

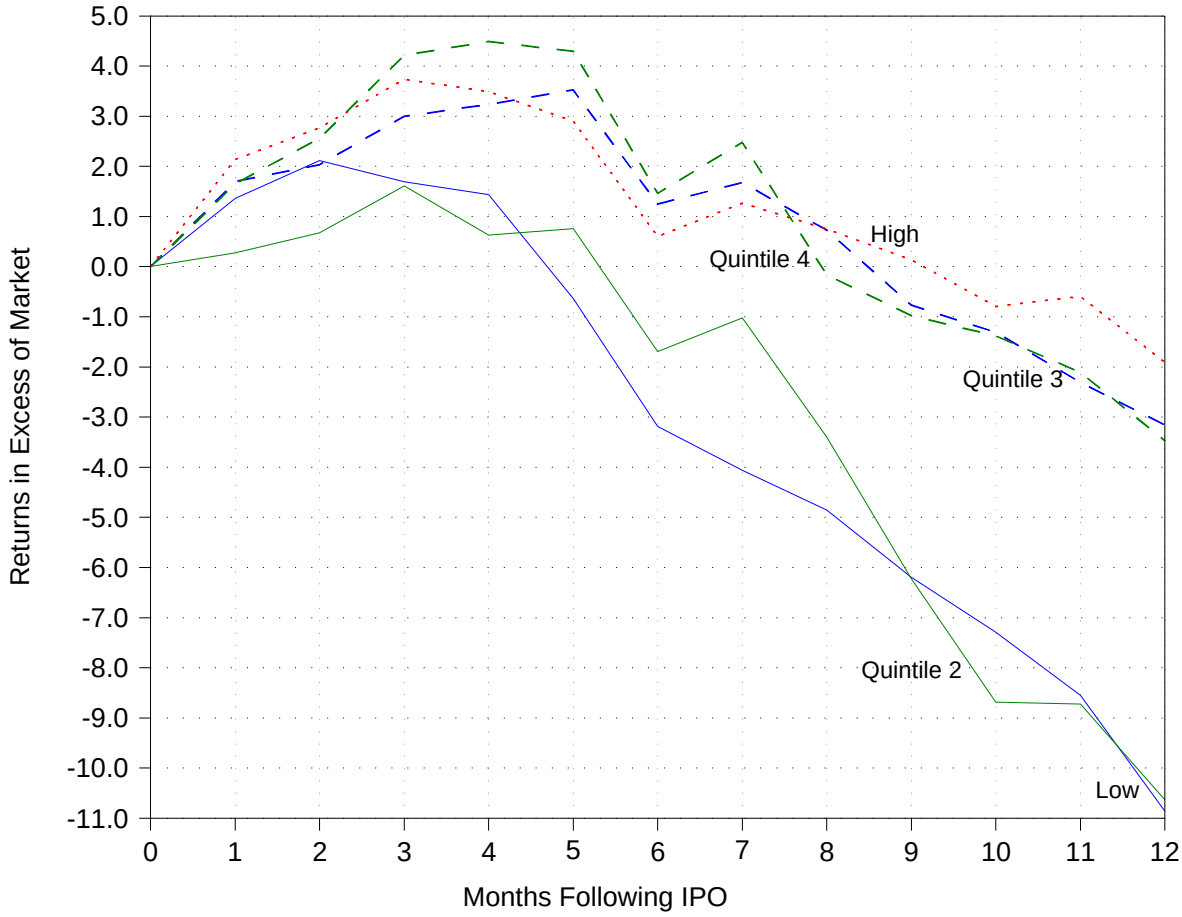

Figure 2. Abnormal Returns, in Excess of Market. This figure plots average buy-and-hold returns, in excess of value-weighted market index, of the five relative price quintiles of the IPO stocks during the 12 months following the issue. Details of assignment into relative price groups and of calculations of the abnormal returns are discussed in Section 3.1. The sample period is 1986-2006.

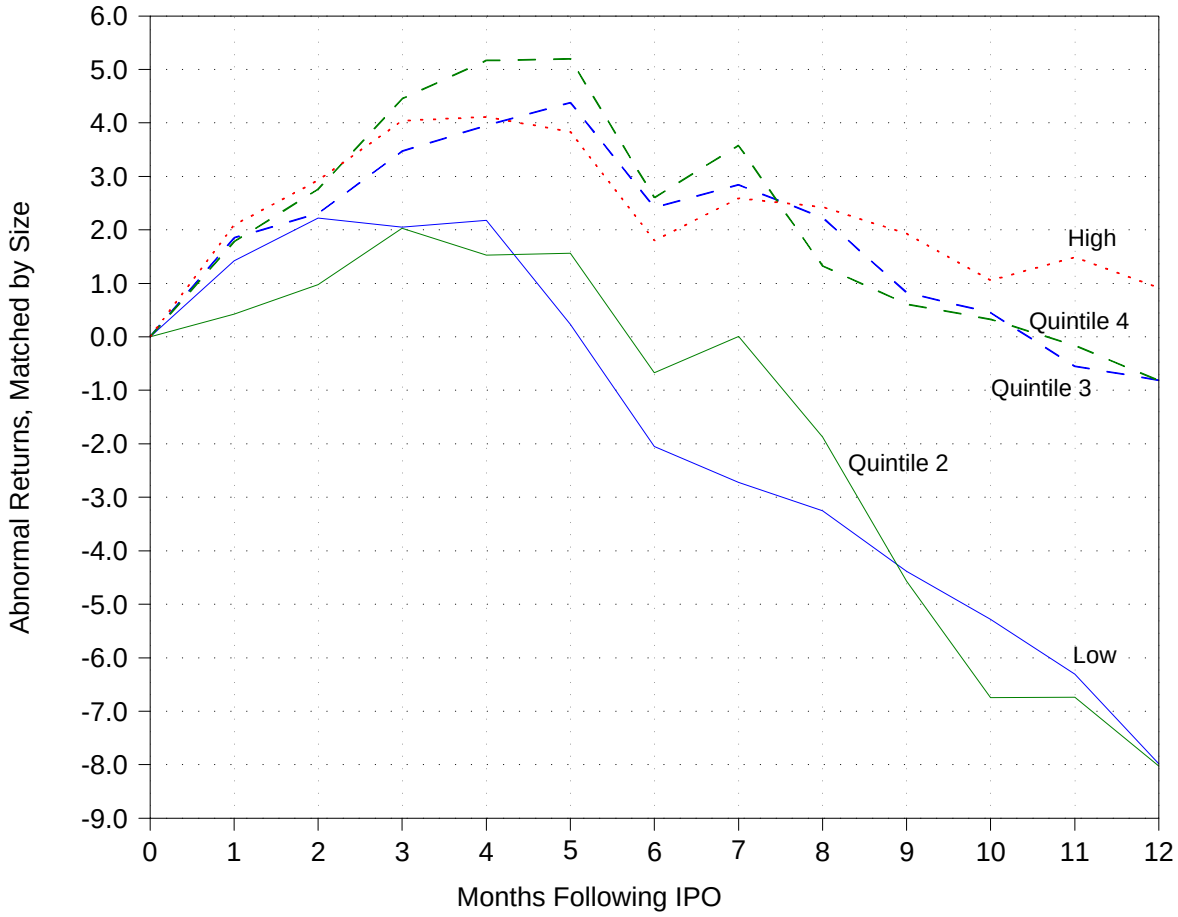

Figure 3. Abnormal Returns, Matching on Size. This figure plots average buy-and-hold returns, in excess of returns on a matching size decile, of the five relative price quintiles of the IPO stocks during the 12 months following the issue. Details of assignment into relative price groups and of calculations of the abnormal returns are discussed in Section 3.1. The sample period is 1986-2006.

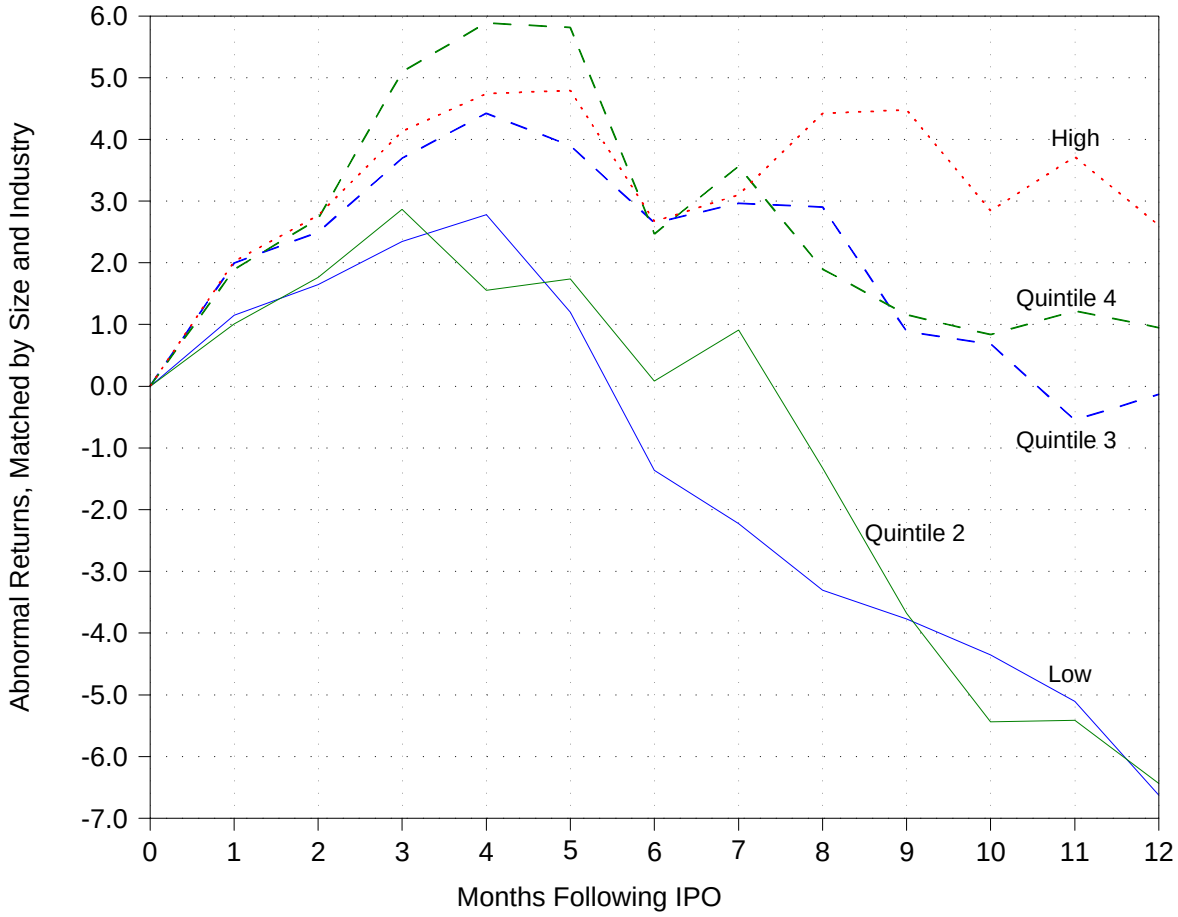

Figure 4. Abnormal Returns, Matching on Industry and Size. This figure plots average buy-and-hold returns, in excess of returns of industry and size matches, of the five relative price quintiles of the IPO stocks during the 12 months following the issue. Details of assignment into relative price groups and of calculations of the abnormal returns are discussed in Section 3.1. The sample period is 1986-2006.

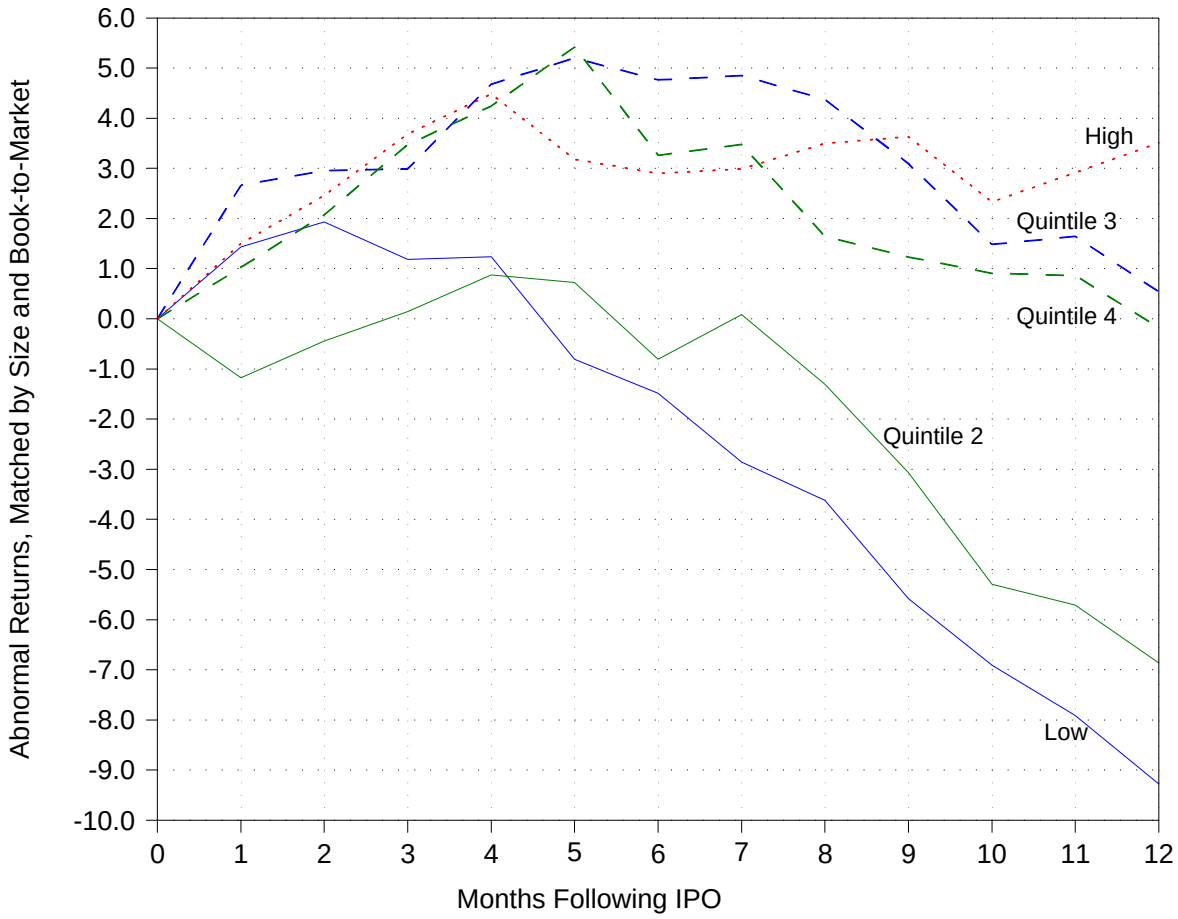

Figure 5. Abnormal Returns, Matching on Size and Book-to-Market. This figure plots average buy-and-hold returns, in excess of returns on a matching size decile, of the five relative price quintiles of the IPO stocks during the 12 months following the issue. Details of assignment into relative price groups and of calculations of the abnormal returns are discussed in Section 3.1. The sample period is 1986-2006.

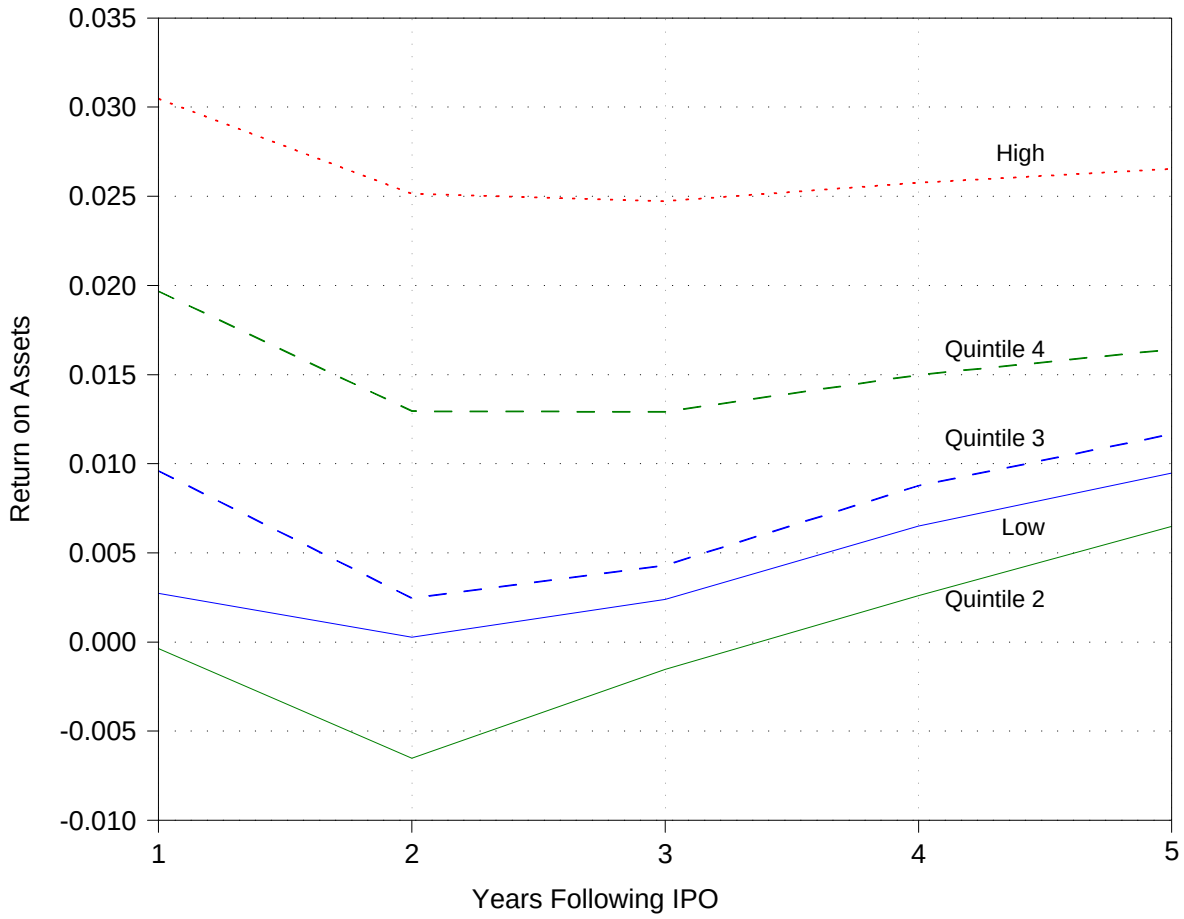

Figure 6. Relative Prices and Profitability. This figure plots average profitability of each of the five relative price quintiles during five years following the IPO. Return on assets in Panel A is defined as operating income divided by total assets, and earnings in Panel B are calculated as earnings before extraordinary items scaled by total assets. Details of assignment into relative price groups are discussed in Section 3.1. The sample period is 1986-2006.

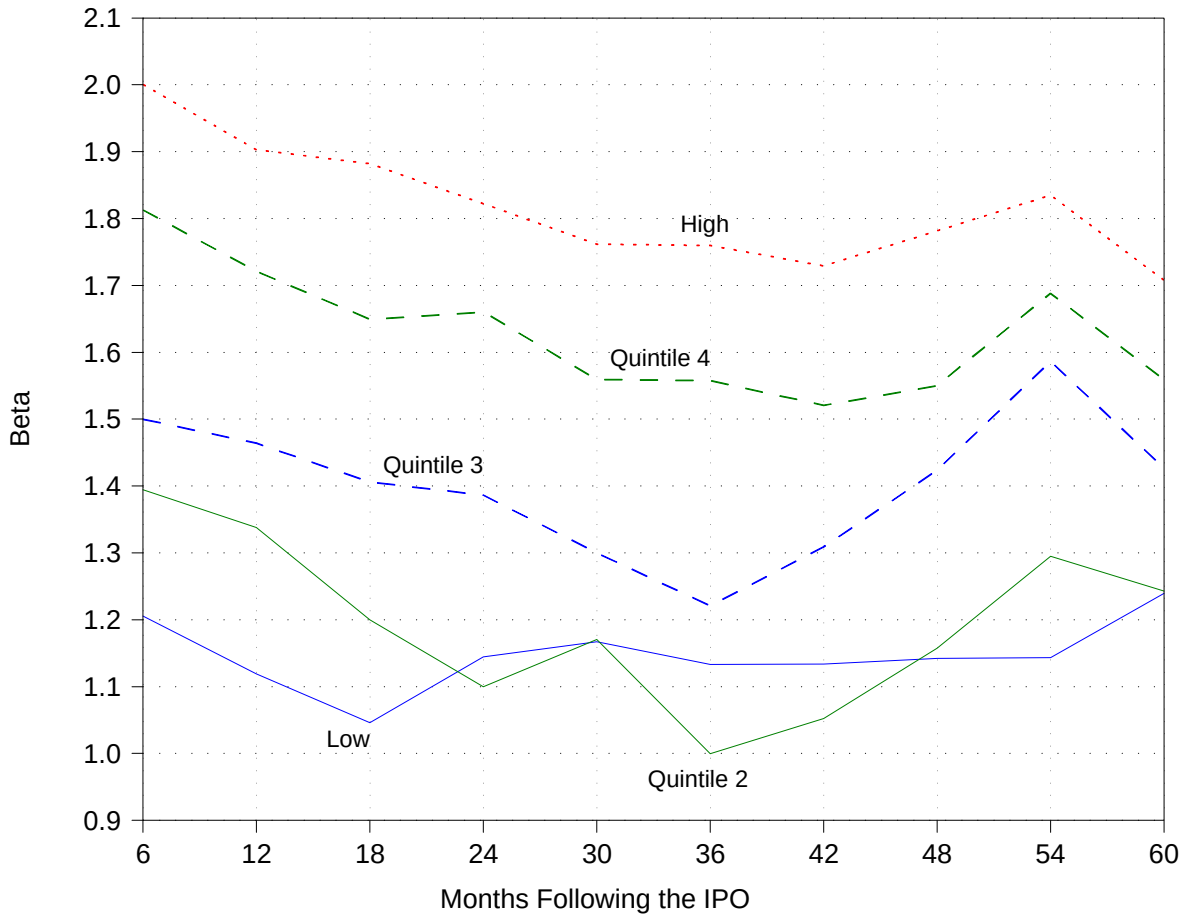

Figure 7. Relative Prices and Betas. This figure plots average market betas of each of the five relative price quintiles during five years following the IPO. Betas are estimated in each six-month interval as the sum of slope coefficients from regressing daily stock excess returns on market excess return, its lag and lead. Details of assignment into relative price groups are discussed in Section 3.1. The sample period is 1986-2006.

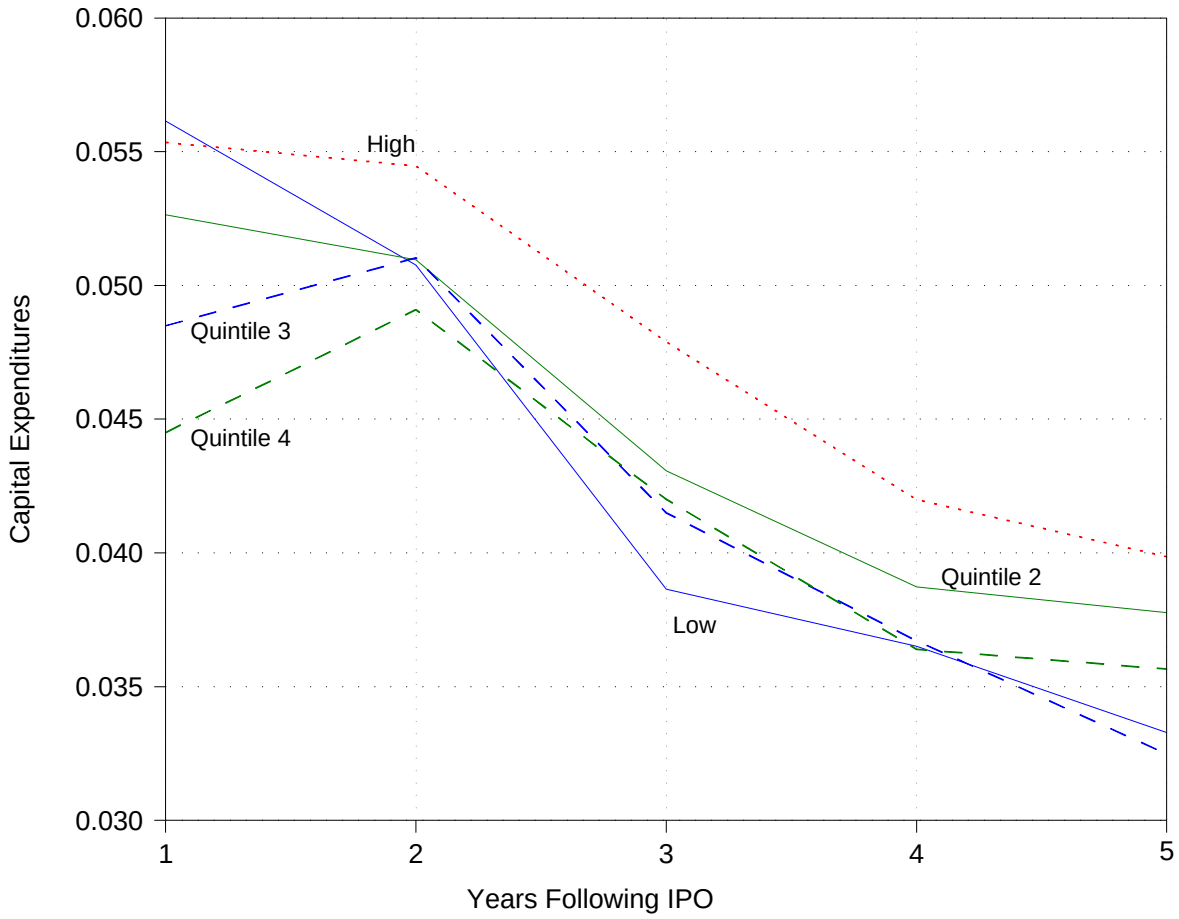

Figure 8. Relative Prices and Investment. This figure plots average investment of each of the five relative price quintiles during five years following the IPO. Investment is defined as capital expenditures divided by total assets. Details of assignment into relative price groups are discussed in Section 3.1. The sample period is 1986-2006.