Do Industry Growth Prospects Drive IPO Stock Performance?

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Abstract

We examine the relation between an *ex ante* measure of IPO growth prospects – the industry-level analyst earnings growth forecast – and short- and long-run IPO performances. Using a sample of 7,434 IPOs from 1982 to 2006, we find that IPOs in industries with high growth prospects generally earn high short-run and long-run returns up to three years after the IPO. Industry growth has a larger economic impact on long-run performance than any other known factors such as underwriter quality and offer proceeds. However, during the internet bubble period (1999-2000), the effect of industry growth on long-run performance reverses so that IPOs in high-growth industries underperform in the long run. Our evidence suggests that barring bubble period overreaction to growth prospects, IPO investors generally underreact to industry growth prospects, leading to superior long-run performance for firms in high-growth industries. The divergence of investor opinion about industry growth, on the other hand, does not appear to explain IPO stock performance, even for the bubble period.

JEL classification: G11, G12, G14, G32
Keywords: industry growth; analyst earnings forecast; IPOs; under- and overreactions; short- and long-run performances; industry categorization

1. Introduction

This paper investigates whether the growth prospects of IPOs affect IPO short-run and long-run stock performances. We use the analyst long-term earnings growth forecast for the IPO firm's industry as a proxy for the IPO's growth potential. We hypothesize that to the extent that investors with limited attention categorize an IPO by its industry in assessing its growth prospects, industry earnings growth rate should be a reasonable approximation for investors' outlook on firm growth.

A priori, it is unclear how industry growth prospects should affect IPO stock performance, especially the long-run performance. One might expect high growth prospects to be associated with high information asymmetry or high risk, and therefore these IPOs should have high short-run returns due to the traditional arguments such as winner's curse or information revelation of informed investors. However, theories based on information asymmetry or risk do not address the long-run performance of IPOs. In fact, when the aftermarket is fully rational, there should be no predictable relation between industry growth measures and long-run risk-adjusted stock performance.

Alternatively, one could hypothesize that IPO participants do not process information correctly, and may either underreact or overreact to earnings growth prospects. If they underreact to the growth prospects of IPOs, they may set the offer price and/or the first-day closing price too low, for IPOs with high growth prospects. Under this underreaction scenario, IPOs with high growth prospects should have better long-run returns because of the initial underreaction to the positive growth potential. Conversely, if investors overreact to information about growth prospects, they may be overoptimistic about IPOs with high growth prospects, leading to high short-run but poor long-run stock performance.

Finally, the divergence of opinion theory suggests another possibility. It posits that in an IPO market with restricted short selling prior to the offer, the IPO price is determined by the most optimistic investors. This biases the price upward in the short-run and leads to a reversal in the long-run as short-sales restrictions are relaxed. According to this theory, the divergence of opinion about industry growth prospects, not industry growth rate *per se*, leads to high short-run returns and low long-run performance of IPOs.

Section 2 provides a more detailed discussion of the hypotheses and the underlying literature. In sum, theory does not have a clear prediction about the relation between industry growth and IPO returns. This needs be resolved empirically.

Using a sample of 7,434 IPOs from 1982 to 2006, we test whether industry growth prospects drive IPO stock performance. We examine the bubble period (01/1999-12/2000) observations separately, because investors may react to growth prospects differently or have a change in their objective functions during the bubble period, and standard Fama-French risk adjustment methodology may not be appropriate for internet bubble IPOs (Ritter and Welch (2002)).

For the non-bubble period observations, when we sort IPOs into three portfolios by industry growth in event time, we find that high growth IPOs have 50% higher mean style-adjusted (matched on size and book-to-market ratio) returns over a 2-year period after the offer than low growth IPOs. Furthermore, the effect is even stronger among larger IPOs: the 2-year abnormal return spread between low and high industry growth portfolios increases to a striking 136% when returns are value-weighted. However, the effect of industry growth prospects on long-run returns reverses during the bubble period: IPOs in high growth industries earn 45% (65%) lower equal-weighted (value-weighted) style-adjusted 2-year returns than IPOs in low growth industries. In both periods, industry growth is positively associated with short-run price performance, measured by either the offer price adjustment or the first-day returns. These results suggest that outside of the bubble period, investors tend to underreact to growth prospects of the IPO's industry, which causes the continual superior return of IPOs in high growth industries. Conversely, investors appear to overreact to industry prospects in the bubble years.

We confirm our findings in multivariate tests that examine the effect of industry growth on both short-run and long-run returns. When we run event-time cross-sectional regressions of long-run risk-adjusted returns on industry growth and a host of controls, we find that industry growth has a significantly positive relation with long-run returns, confirming the portfolio test results. Strikingly, the multivariate tests suggest that among all the factors we examine (including underwriter reputation, the number of managing underwriters, and expected proceeds), industry growth has the strongest effect on long-run returns. For example, in non-bubble times, a one-standard-deviation increase in industry growth rate forecast leads to a 44% increase in 3-year style-adjusted return, larger than the next strongest effect of underwriter reputation, which has a corresponding effect of 38% on 3-year abnormal return. Again consistent with the portfolio test, the regression test also indicates that industry growth has a negative effect on the long-run performance of IPOs during the bubble years.

We also conduct calendar-time long-run return regressions to further confirm our long-run performance findings for the non-bubble period; prior research shows that the calendar-time methodology appears to be inappropriate for the bubble period. In sum, our evidence suggests that barring bubble period overreaction to growth prospects, IPO investors generally underreact to industry growth prospects, leading to the superior long-run performance for firms in high-growth industries.

In our event-time regressions, we control for an *ex ante* measure of divergence of investor opinion about industry growth – the standard deviation of analyst long-term growth forecast scaled by the mean forecast – among other controls. In both the non-bubble and bubble periods, this variable is never significant in the long-run return regressions, suggesting that divergence of opinion is unlikely to drive the differences in long-run performance.

An important advantage of using an industry-level growth proxy is that it circumvents the need of identifying comparable firms, an often noisy process. Moreover, instead of relying on specific valuation multiples, all we require is that the industry-level growth is correlated with the

IPO firm's growth. This reduces misspecification problems both in identifying comparable firms and in specifying valuation metrics, while keeping the sample IPOs to a maximum. These considerations help explain why we can uncover an economically significant driver of IPO stock performance with a relatively easy-to-construct measure of IPO growth prospects.

The rest of the paper is organized as follows. Section 2 develops the hypotheses and describes measures of industry growth prospects and divergence of opinion. Section 3 describes the data, methodology, and summary statistics of our IPO sample. Section 4 describes cross-sectional tests on the short-run and long-run stock performances. Section 5 presents calendar-time long-run performance tests. Section 6 discusses the interpretations of the empirical findings. Section 7 concludes.

2. Hypotheses

We examine the relation between industry growth measures and IPO short- and long-run stock performances in light of three hypotheses. In this section, we first describe these hypotheses, followed by a discussion of our measure of industry growth prospects and belief dispersion, and a summary of the empirical implications of the three hypotheses on short- and long-run returns.

2.1 Information Asymmetry / Risk

Traditional theories assume market efficiency and treat the first-day closing price as the correct value of the IPO, which implies that IPOs are on average deeply underpriced at the offer. For example, Rock (1986) proposes a winner's curse interpretation whereby underpricing is necessary to induce uninformed investors to participate in the offering. Benveniste and Spindt (1989) link underpricing to truth-telling of investors in the book-building process. Chemmanur and Fulghieri (1994) and Loughran and Ritter (2004) relate underpricing to underwriter reputation or a changing issuer objective function. Accordingly, firms with high information asymmetry, or equivalently, high-uncertainty or risk, as measured by high growth prospects, require larger underpricing to either attract uninformed investors to participate to the offer or to encourage more information revelation.

However, these theories do not address the long-run performance of IPOs. In fact, since information is quickly reflected in the price after the offer, there should be no predictable relation between publicly available information, including industry growth measures, and long-run risk-adjusted stock performance.

2.2 Under- or Overreaction to Growth Prospects

Investors suffering cognizance biases do not process information correctly, and may exhibit systematic under- or overreactions to earnings growth prospects. If market participants tend to underreact to information about the growth prospects of IPOs, as predicted by models such as Barberis, Shleifer, and Vishny (1998) and Hong and Stein (1999), they may set the offer price too low, and / or set the first-day closing price too low, for IPOs with high growth prospects. Under the underreaction scenario, IPOs with high growth prospects should have better long-run returns because of the initial underreaction to the positive growth potential. Moreover, the relation between expected growth potential and short-run price performance is expected to be positive, if the initial price only partially reflects information about industry growth.

Conversely, it is possible that investors tend to overreact to information about growth prospects. More specifically, they may be over-optimistic (pessimistic) about IPOs with high (low) growth prospects (e.g., Daniel, Hirshleifer, and Subrahmanyam (1998)), leading to high (low) first-day returns and poor (high) abnormal long-run performance as the initial overreaction is corrected over time.

2.3 Divergence of Opinion

The divergence of opinion theory, first proposed by Miller (1977) and further formalized by Morris (1996), posits that in a market with restricted short selling, the price of a risky security is determined by the most optimistic investors. This is because pessimistic investors are unable to short-sell shares, thus muting their assessment. This biases the share price upward in the short-run and leads to a reversal in the long-run as short-sales restrictions are relaxed.

As discussed in Miller (1977), IPOs are a good testing arena for the divergence of opinion hypothesis for three reasons. First, short-selling is not possible prior to the offer, which allows the impact of divergence of opinion to play out to the fullest extent before the offer. Second, IPO firms face greater uncertainty and divergence of opinions than “seasoned” firms, again because there is no trading record at the time of the offering. Finally, as information builds up in the after-market, uncertainty and divergence of opinion are reduced and the price should *decline* to its fundamental value. So, the Miller hypothesis predicts initial overpricing and subsequent underperformance.

The Miller (1977) theory is based on the premise that investors have divergence of opinion, or belief dispersion. The dispersion in beliefs can potentially arise from many sources, including investor overconfidence. For example, in the model of Daniel, Hirshleifer, and Subrahmanyam (1998), overconfidence can cause belief dispersion between overconfident and fully rational investors. Overconfidence may be especially relevant in IPO pricing, because to bid for an IPO with no trading record, investors have to rely on private information, more so than in secondary market trading. However, overconfidence could be associated with other theories such as underreaction or overreaction to information (Hirshleifer (2001)).

2.4 Measures of Growth Prospects and Divergence of Opinion

Prior research has used accounting based valuation metrics of comparable firms to value IPOs (e.g., Kim and Ritter (1999) and Purnanandam and Swaminathan (2004)). In this paper, we take a different approach. Instead of using specific valuation ratios such as price-to-earnings or price-to-sales, we simply use the expected growth rate of the IPO’s industry to gauge the growth prospects of the IPO firm.

Recent literature in financial economics documents an important role for limited attention, a phenomenon documented in psychology (Kahneman (1973)), on investor behavior and financial markets. For example, Hirshleifer and Teoh (2003) show that firms may strategically choose alternatives means of financial reporting when investors have limited attention and processing power. Hirshleifer, Hou, Teoh, Zhang (2004) document that investors with limited attention often focus on accounting profitability and neglect information about cash profitability. Corwin and Coughenour (2007) show that NYSE specialists allocate effort toward their most active stocks during periods of increased activity. Hirshleifer, Lim, and Teoh (2008) document that limited attention causes investors to underreact to earnings news. Cen et al. (2007) document a strong lead-lag relationship between stock returns of minor segment firms and pure players in industry leaders' major segment industries, and that this relationship is driven by the representativeness bias of attention-constrained investors.

Given that investors have limited attention resource while information is vast, one of investors' most natural solutions is "categorization", a tendency of investors to categorize assets into certain "visible" or "recognizable" categories. Investors often categorize securities into "small stocks", "tech stocks", "Internet stocks", "dividend-paying stocks", and so forth. There are investors who do not pay much attention beyond categorization when analyzing securities (Cooper, Dimitrov, and Rau (2001), Barberis and Shleifer (2003), Barberis, Shleifer, and Wurgler (2004), Baker and Wurgler (2004), and Barber and Odean (2008)). In the model of Peng and Xiong (2006), it may be optimal for attention-constrained investors to neglect firm-specific information.

Perhaps the most salient feature about a firm is its industry; in the case of an IPO, industry is also a firm's most recognizable feature prior to the offering. The role of industry on stock returns and information flow are well-documented (e.g., Barberis, Shleifer, and Wurgler (2004), Hou (2006), and Cen et al. (2007)). This analysis implies that attention-constrained investors will categorize IPOs by their industries. Edelen and Kadlec (2005) and Wang, Winton, and Yu (2009) show that the IPO's industry provides reasonable comparables for IPO characteristics. For these reasons, we use analyst earnings growth forecast for the IPO's industry as our proxy for the growth prospects of the IPO. IPOs firms are typically young and in their early stages of growth, so long-term growth rate is a better reflection of their growth prospects. Therefore, we measure industry growth by the average mean analyst long-term earnings growth forecast in the IPO firm's industry in the month prior to the offer. We denote this variable by IGROW.

The divergence of opinion hypothesis of Miller (1977) requires an estimate for belief dispersion. Several studies use analyst earnings forecast to measure IPO growth prospects (e.g., Wang, Winton, and Yu (2010)) and its dispersion as a proxy for divergence of opinion (e.g., Diether, Malloy, and Scherbina (2002) and Moeller, Schlingemann, and Stulz (2007)). As with the proxy for industry growth, we use the long-term growth forecast and measure its dispersion. However, the dispersion in long-term growth forecasts for a firm is positively correlated with the mean value of the forecast. To purge the effect of the mean value of the long-term growth forecast (which is likely associated with uncertainty), we use standardized dispersion in analyst earnings growth forecasts aggregated at the industry-level – the dispersion in analyst long-term earnings growth forecasts divided by the absolute value of the mean long-term growth forecast averaged at the industry level in the month prior to the IPO – as a proxy for industry-level divergence of opinion. We denote this variable by IDISP.

The first advantage of using an industry-level growth proxy is that it circumvents the need of identifying comparable firms, an often noisy process, as is done in Kim and Ritter (1999). Moreover, instead of relying on specific valuation multiples, all we require is that the industry-level growth is correlated with the IPO firm's growth. This tremendously reduces misspecification problems both in identifying comparable firms and in specifying valuation metrics.

The second advantage of using an *ex ante* measure of growth prospects (IGROW) and divergence of opinion (IDISP) is that we can test the causal relationship between growth prospects (and heterogeneous beliefs) and IPO stock performance. Past studies testing the Miller effect on IPOs use *ex post* measures which rely on information available only after the IPO issuance and therefore are not able to examine the impact of investor heterogeneity on first-day returns. The information right after the IPO may reflect investor reaction to the offer price and first-day returns, in addition to the uncertainty of the IPO. Therefore, these studies can at best offer a partial test of the Miller (1977) prediction about asset overvaluation.

The third advantage of using an industry-level analyst forecast measure is that we can more clearly identify the economic source of potential IPO misvaluation, if we find a significant association between such a measure and IPO stock performance. As discussed above, this line of reasoning highlights the role of limited attention, investor categorizing, and overconfidence that is being documented in the finance literature.

Another advantage of our approach is that we can maximize the sample size and offer the most general test for our hypotheses, because we do not rely on the accounting items for computing an intrinsic value of the IPO as in Purnanandam and Swaminathan (2004) and Chemmanur and Krishnan (2009). Our IPO sample size each year more than doubles that of comparable studies (e.g., Purnanandam and Swaminathan (2004)).

2.5 Summary of Theory Predictions

Aggregating the theory predictions on short-run and long-run returns, we can now summary the empirical predictions of the above three hypotheses as follows:

		Effect on	
Hypothesis	Variable	Short-run return	Long-run return
Information asymmetry/risk	Industry growth (IGROW)	+	0
Underreaction Overreaction	Industry growth (IGROW)	+ +	+ –
Divergence of opinion	Dispersion in belief about industry growth (IDISP)	+	–

The three hypotheses are not necessarily mutually exclusive. For example, the information asymmetry effect could lead to a positive relation between industry growth and the short-run price, but the under- or overreaction effects can cause a relation between industry growth and long-run performance. Finally, investors may react to the same type of information about earnings growth differently during different periods, depending on factors such as stock market conditions or technological advances. It is possible that underreaction is exhibited in certain periods and overreaction exhibited in others times.

An empirical pattern of IPO market performance as exemplified in the bubble period – initial high positive returns followed by poor long-run returns – appears consistent with Miller's theory. However, as with other empirical regularities, this pattern is potentially consistent with other theories, for instance, the overreaction hypothesis. Furthermore, the long-run "underperformance" of IPOs documented by early research (e.g., Ritter (1991) and Loughran and Ritter (1995)) largely disappears when more recent sample is used. This highlights the importance to examine the effects of both industry growth and belief dispersion, since both variables could drive IPO returns.

3. Data and Methodology

3.1 Data

We obtain data on IPOs of ordinary common shares from 1982 to 2006 from the Securities Data Company (SDC).[1] We eliminate 536 IPOs that are not covered by the Center for Research in Security Prices (CRSP) within one month of the offering, and 764 IPOs with an offer price less than $5, leaving 8,809 observations. Additionally, we eliminate 4 IPOs for which our variable of interest, average industry analyst earnings growth forecasts, is missing, leaving 8,805 observations (the "broad" sample). Finally, after removing unit offerings, closed-end funds, American Depository Receipts (ADRs), Real Estate Investment Trusts (REITs), and Shares of Beneficial Interest (SBIs), we have 7,434 IPOs in the "full sample".

We examine the bubble period (01/1999-12/2000) observations separately, for several reasons. First, investors may react to information such as industry growth prospects differently in the bubble period, influenced by bubble period hype on internet or technology in general, as often pointed out by commentators. Second, there is evidence that underwriters may have a change in their objective functions in the late 1990s (Loughran and Ritter (2004)). Third, Ritter and Welch (2002) document that standard Fama-French risk adjustment methodology can produce very odd long-run return results for internet bubble IPOs. Our final "non-bubble" sample has 6,609 IPOs, while the "bubble" sample has 825 IPOs.

We obtain company founding dates and Carter and Manaster (1990) underwriter reputation rankings updated by Professor Jay Ritter.[2] Share prices, returns, share codes and shares outstanding are obtained from CRSP and accounting data are from Compustat. Industry classifications,[3] industry returns, and Fama and French (1993) factors are obtained from Professor

[1] We begin ours sample in 1982 because analyst earnings growth forecasts from IBES are only become available in that year. We end our sample in 2006 to allow for a 3 year window to calculate long-run returns.
[2] http://bear.cba.ufl.edu/ritter/ipodata.htm
[3] We augment the Fama-French 49-industry classification with an Internet industry to create a 50-industry classification. Specifically, we reclassify firms which are classified as Internet firms according to Professor Jay R. Ritter's list of Internet IPOs into a 50th industry. Additionally, we move sic code 8731 from Business Services to Pharmaceuticals similar to Edelen and Kadlec (2005).

Kenneth French's website.[4] Analyst earnings forecasts are taken from I/B/E/S. Finally, we obtain the Lyandres et al. (2008) investment factor from the authors.

3.2 Summary Statistics of IPOs

Table 1 reports summary statistics for variables used throughout this paper. Panel A reports industry and firm-level long-term analyst earnings forecasts. The first variable, our measure of growth prospects, is the industry-average mean analyst long-term earnings growth forecast (IGROW). It has a mean (median) of 20.93% (18.96%). The second variable, IDISP, is the industry-level standard deviation of analyst long-term earnings growth forecasts scaled by the absolute value of the mean analyst long-term forecast, averaged across all firms in the IPO firm's industry in the month prior to the offer.[5] Since the mean and standard deviation of the long-term earnings growth forecasts are 70.6% correlated, and our goal is to capture divergence of opinion and not earnings growth, we standardize dispersion of analyst forecasts by the absolute value of mean analyst forecasts to form our measure of belief dispersion (IDISP). It has a mean of 24.37%, with a median of 22.47%. We also gather the above three variables for IPOs when it is first available in the year after the offer. The firm-level standardized dispersion of analyst forecasts is on average lower than its industry-level equivalent, but more variable.

Firm age, defined as the number of years between the IPO and the year the firm was founded, is 16.09 years on average (8 years in median). This is similar to Ljungqvist and Wilhelm (2005) who find an average age of 14.4 years, albeit on a much shorter sample period, and also to Loughran and Ritter (2004) who find a median age of 7 years over the same sample period. Other variables have similar values to those found in the literature.

Panel B reports market characteristics. We use two measures of short-run price performance. The first is the price adjustment of the offer price (PRADJ), defined as the

[4] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

[5] Although unreported, the mean (median) standard deviation of long-term growth forecasts of 4.94% (4.10%) is very similar to the numbers in Moeller et al. (2007).

percentage change in price from the file price to the offer price. It has a mean (median) of –0.27% (0). The second short-run performance measure is the first-day return (FDRET), defined as the percentage increase in the first trading day closing market price from the offer price. It is 17.61% in mean (6.25% in median), similar to Loughran and Ritter (2004) who study the same time period and find a mean first-day return of 18.7% (6.3% in median).[6] We examine long-run performance over the first three years after the IPO. We calculate buy-and-hold returns using daily returns from the beginning of the holding period until the end of the holding period or the delisting date, whichever is earlier. Style-adjusted buy-and-hold abnormal returns (BHARs) are calculated as the difference between the IPO's buy-and-hold return and the buy-and-hold return from an equal-weighted portfolio matched on size and book-to-market. BHARs are very close to zero for each of the three horizons.

In Table 2, yearly means are provided for the main variables used throughout this paper. The annual number of IPOs is consistent with prior literature such as Loughran and Ritter (2004). Figure 1 plots the monthly distribution of IGROW, FDRET and number of IPOs to get a better picture of the time-series variation in the industry growth measure. Interestingly, both industry growth and first-day return peak in the bubble period, while the number of IPOs peaks before the bubble period. IGROW decreases in the late 1980s and increases throughout the 1990s reaching a peak in the year 2000, after which their values yet again decline. Unlike industry growth, the measure of divergence of opinion, IDISP, peaks in the late 1980s and in the 2000s. This seems to indicate that industry growth has a much stronger association with the extreme first-day returns of the bubble period (1999-2000) than divergence of opinion does.

Overall, for all IPOs in our sample, the mean equal-weighted BHARs are –0.4%, 6.3%, and 4.8%, respectively (not significantly different from zero based on t-statistics); in the non-bubble period, they actually earn statistically positive abnormal returns. This indicates that there

[6] Loughran and Ritter exclude Banks and Savings & Loans and supplement their data with data from Dealogic and other sources, while we do not.

is no general underperformance in the long-run returns of IPOs. However, in the bubble period, IPOs substantially underperform in the long-run, consistent with the conclusion from the press.

We sort the sample firms yearly into 3 portfolios based on IGROW, and examine the portfolio characteristics of IPOs with low, medium and high IGROW in Table 3. To control for the time pattern in IGROW, we sort the sample firms monthly into 3 portfolios based on IGROW. Table 3 examines the differences in industry growth, analyst dispersion, and firm and offer characteristics between high and low IGROW portfolios, for the full sample as well as for the non-bubble and bubble periods separately.

Overall, high IGROW IPOs tend to be smaller (with lower expected proceeds) and younger growth firms. However, there are noticeable differences across the IGROW portfolios between the non-bubble and bubble periods. For example, the spread in IGROW between the high and low IGROW portfolios is much larger for the bubble period than for the non-bubble period; the analyst dispersion measure (IDISP) is negatively correlated with IGROW in the non-bubble period (and for the full sample), but the relationship is positive in bubble period; firms are younger and have higher expected proceeds in the bubble period; and the proportion of technology firms or internet firms is much higher in the bubble period. In fact, during the bubble period, 97% (93%) of IPOs in the high IGROW portfolio are internet (technology) IPOs.

What these data tell us is that many variables such as IGROW, TECH, and INTERNET are highly correlated, especially in the bubble period. We control for all of these firm and offer characteristics in multivariate regressions to ensure that they are not driving our results. The differences between the two periods also suggest that, in assessing the economic impact of these variables on IPO performance, we should use the characteristics (such as standard deviation) for each period separately.

4. Cross-Sectional Short- and Long-Run Performances

In this section, we first present short-run and long-run return results for univariate portfolios sorted by industry growth (IGROW). We first look at results for the full sample, followed by the separate "non-bubble" period (1982-1998 and 2001-2006) and the "bubble" period (1999-2000) results. We then present results for event-time multivariate regression tests where we control for multiple factors including the divergence of opinion variable (IDISP).

4.1 Univariate Tests

As a first look at the effect of industry analyst dispersion on IPO market performance, Table 4 reports univariate sorts of cumulative style-adjusted buy-and-hold returns into terciles based on low, mid and high IGROW, for the full sample. Equal-weighted portfolios are reported in Panel A, while Panel B reports value-weighted portfolios. We measure short-run market performance by two variables: the offer price adjustment (PRADJ), and the first-day return (FDRET). We measure the long-run performance by style-adjusted buy-and-hold returns (BHARs), defined as the difference between the IPO's buy-and-hold returns and the buy-and-hold return from an equal-weighted portfolio matched on size and book-to-market (5 × 5 benchmark portfolios). The t-statistics for equality of means are based on simple two-sample test statistics computed under the assumption of independence. Empirical p-values are also reported since the sample distribution of BHARs tends to be misspecified in event studies, especially for long-run returns.[7]

Table 4 shows that over the full sample period, industry growth is positively associated with short-run returns as measured by both PRADJ and FDRET. However, the relationship between IGROW and BHAR for each of the 1-year, 2-year, and 3-year horizon is not clear-cut. There is some evidence of a positive relationship in the equal-weighted BHARs, but the relationship does not hold in the value-weighted returns, especially judging by the empirical p-

[7] See Purnanandam and Swaminathan (2004, p. 829) for a description of this procedure. Briefly, using empirical p-values preserves the skewness, time-series autocorrelation and cross-sectional properties of the original sample, all of which are at the root of the misspecification of long-run returns.

values. As will be clear below, the full sample hides two different effects of IGROW on long-run returns for the non-bubble versus bubble periods.

Tables 5 and 6 report the portfolio results separately for the non-bubble and bubble periods, respectively. There remains a positive relation between IGROW and short-run performance (measured by PRADJ and FDRET), for both the non-bubble and bubble periods. However, the effect of IGROW on long-run performance is fundamentally different between the two periods.

Table 5 shows that in the non-bubble period, there is a strong positive relation between IGROW and long-run abnormal stock performance, which suggests that investors underreact to industry growth prospects at the time of the offer and in the years after the offer. For example, high IGROW IPOs have 49.8% higher mean 2-year equal-weighted style-adjusted returns than low IGROW IPOs, and the difference is highly significant, judging by the t-statistics or empirical p-value. The Panel B results when returns are value-weighted are even starker. Specifically, high IGROW IPOs have 135.6% higher mean 2-year value-weighted style-adjusted returns than low IGROW IPOs. This result indicates that the effect of industry growth on IPO performance is not driven by small firms. In fact, the industry effect is stronger for large IPOs.

Table 6 indicates that during the internet bubble period, IGROW has an even stronger positive effect on short-run performance than that in the non-bubble period. For example, the high IGROW portfolio has a mean equal-weighted (valued-weighted) FDRET of 89.8% (182.5%). As seen from Table 3 Panel C, this portfolio contains almost entirely internet IPOs. At the same time, these IPOs earn substantially lower abnormal returns in the 3 years after the offer. For example, the high IGROW firms earn 44.5% (64.9%) lower 2-year abnormal returns than low IGROW firms. These results suggest that during the bubble period, investors are overoptimistic about the growth prospects of certain high growth industries and bid up the short-run price too high, leading to a poor performance in the long run. In spirit, this result is consistent with the findings of Ritter and Welch (2002) and Loughran and Ritter (2004) who suggests that certain economic forces and investor behaviors during the bubble period are different from other periods.

Figures 2-4 provide a graphical summary of the portfolio tests. Figure 2 shows the equal-weighted short-run and long-run market performances separately for the non-bubble and bubble periods. Figure 3 shows the same pattern for the value-weighed returns, with even striking magnitude of both the short- and long-run effects of industry growth. Figure 4 plots the high-low IGROW hedge profits for the non-bubble and bubble periods, to highlight the differential effects of IGROW on IPO stock performance during the two different periods.

During the non-bubble years, the average portfolios returns are all positive for the high IGROW portfolios, and closer to zero for the low IGROW portfolios. This result suggests that the divergence of opinion theory of Miller (1977) is unlikely to have a dominant effect on the stock performance during the non-bubble periods. The bubble-period pattern – short-run overreaction and long-run underperformance – could be a result of investor overreaction to industry growth or a result of the divergence of opinion. We address this topic further in the multivariate tests.

4.2 Multivariate Tests

We now turn to the cross-sectional analysis of short-run return measures and long-run risk-adjusted returns in order to determine whether the effects of industry growth on IPO stock performance hold in a multivariate setting.

We test the cross-sectional relationship between industry growth and IPO returns in multivariate regressions of the following form:

$$FDRET_i = b_0 + b_1\, IGROW_i + b_2\, IGROW_i \times BUBBLE_i + b_3\, BUBBLE_i + b_4\, IDISP$$
$$+\, b_5\, Ln(1+AGE_i) + b_6\, UWREP_i + b_7\, Ln(EPROCEEDS_i) + b_8\, VENTURE_i + u_i$$

The dependent variables for our short-run return regressions are the offer price adjustment (PRADJ) and the first-day return (FDRET), respectively. In the independent variable list, we include IDISP to control for any divergence of opinion effect. We include underwriter quality measures (UWREP and NMGR), because Dong, Michel, and Pandes (2011) find they affect long-run IPO performance. UWREP is the average Carer and Manaster (1990) underwriter rating of all lead underwriters in the IPO. Ln(NMGR) is the natural logarithm of the number of managing underwriters in the underwriting syndicate. AGE is the number of years between a firm's founding year and the year of its IPO. VENTURE equals one when the IPO is backed by a venture capital firm, and zero otherwise. EPROCEEDS is the expected offer proceeds defined as the product of file price and number of file shares. This variable is ex ante relative to all dependent variable include PRADJ.

For long-run return regressions where the dependent variables are 1-year, 2-year, or 3-year BHAR, respectively, we also include BV/MV in the regression. MV is the number of shares outstanding times the close price on the first day of trading. BV/MV is the book value of equity after the offer divided by the market value of equity. We also run regressions separately for the non-bubble and bubble periods, with the BUBBLE and its interaction variable removed from the regression.

Short-run return regression results are reported in Table 7, while long-run return regression results are reported in Table 8. In Table 7, the positive and significant coefficients of IGROW in the PRADJ and FDRET regressions for the full sample as well as the non-bubble and bubble periods confirm the univariate finding that industry growth is positively associated with short-run price effects, with stronger effects for the bubble period. For example, a one-standard-deviation increase in IGROW leads to a 4.1% (=0.64 ×5.73, where 5.73% is the standard deviation of IGROW during the non-bubble period) increase in FDRET in the non-bubble period. The corresponding effect during the bubble period is a much higher 19.6% (=1.29 × 15.20).

In Table 8, the coefficients of IGROW in the long-run return regressions indicate that the effect of industry growth on long-run IPO performance flips from positive for the non-bubble period to negative for the bubble period, confirming the finding from univariate portfolio sorts. Interestingly, the proxy for divergence of opinion (IDISP) shows up insignificantly in all the regressions for both non-bubble and bubble periods. This result suggests that the dispersion of investor belief about industry growth is unlikely to be of first-order importance in explaining IPO performance, once industry growth itself is taken into account.[8]

During the non-bubble period, underwriter rating (UWREP) and the number of managing underwriters (NGMR) both have a positive effect on long-run performance, consistent with Dong et al. (2011). We also find that the expected proceeds (EPROCEEDS) has a significant and negative effect on long-run returns. Note that EPROCEEDS has a negative effect on short-run returns (Table 7), which could indicate either a dilution effect of the offer on share price or issuers offering more shares when they believe the valuation is high. The strong and negative coefficient of EPROCEEDS on long-run returns is more consistent with a market timing interpretation, because dilution should not have a long-run effect on price.[9]

In terms of economic significance, a one-standard-deviation increase in IGROW leads to a 44.5% (7.76 × 5.73) increase in 3-year BHAR during the non-bubble period. This is larger than the impact of any other factor considered; in descending order, the corresponding absolute values of the impact of other significant factors are: 38.2% for UWREP, 30.9% for Ln(EPROCEEDS), and 20.2% for Ln(1+NMGR).

[8] Table 7 shows that IDISP has a negative effect on the first-day return (FDRET) during the non-bubble period. This raises the possibility that divergence of opinion causes an initial IPO overvaluation that is corrected on the first day when short selling is allowed. However, IDISP has a similar negative effect on the pre-offer price adjustment (PRADJ), which should not be caused by the Miller (1977) effect because shorting is not feasible prior to the offer.

[9] In untabulated tests, when we replace EPROCEEDS with actual proceeds (PROCEEDS = offer price × number of shares offered), all of our main results remain unaffected, but PROCEEDS becomes significantly negative (at the 10% level) for the 1-year BHAR for the bubble period.

In the bubble period, the only two significant variables for long-run BHARs are IGROW and Ln(1+AGE). IGROW attains the greatest statistical significance (at the 1% level) for the 2-year BHAR. This result may be understandable given the erratic market behavior during bubble times and suggests that in the bubble years, investors are overoptimistic about IPOs in general, but especially about IPOs in high growth industries with young ages. In terms of economic significance, a one-standard-deviation increase in IGROW leads to a 21.4% (1.41 × 15.20) drop in 3-year BHAR, compared to a corresponding impact of 21.3% for Ln(1+AGE).

5. Calendar-Time Long-Run Performance

The evidence we have presented up to now shows that industry growth rate positively (negatively) predicts IPOs stock returns in the 3 years following the IPO, for the non-bubble (bubble) periods, respectively. These tests, which control for systematic risks in the case of event-time risk-adjusted returns, still have some limitations. In this section, we report calendar-time risk-adjusted performance of high, medium and low industry growth portfolios. These tests avoid the autocorrelation problems present in overlapping returns and account for cross-correlation among returns across clustered events. On the other hand, the power to detect abnormal performance when it is present tends to be lower than other tests (Loughran and Ritter (2000)). We examine these performance measures over the first three years after the IPO.

5.1 Non-Bubble Period

Our sample of IPOs again covers the period from 1980 to 2006, excluding the bubble period IPOs (1999-2000). However, we only begin to examine calendar-time portfolio market performance in 1983 and end in 2008 because we require that enough firms be in each portfolio in order to make reliable inferences. Therefore, we have 312 monthly observations for the calendar-time regressions.

Calendar-time factor-adjusted returns are obtained using LSZ (2008) plus Carhart's (1997) momentum factor (five-factor) regressions involving the monthly calendar time returns of IPO portfolios. IPOs can remain in the sample for a 3-year period after which time they drop out. More specifically, IPOs are assigned to a high, medium, or low IGROW monthly portfolio starting the second calendar month after the IPO. The IPOs stay in the sample for up to 3 years, but the portfolios are rebalanced monthly. The factor-adjusted return is the intercept from this regression.

Table 9 reports the results of the calendar-time regressions, the intercepts of which can be interpreted as the risk-adjusted monthly abnormal returns for the 3-year holding period. Bubble period IPO observations are excluded from the regressions. Panel A reports results for equal-weighted portfolios, while Panel B shows results for value-weighted portfolios. Overall, we find that IPOs do not underperform on a risk-adjusted basis. In Panel A, the intercept for the high minus low industry growth zero-investment portfolio is −0.83% (significant at the 5 % level), indicating that the high IGROW portfolio outperforms the low IGROW portfolio by about 30% (0.83×36) over a 3-year period. Looking at the individual portfolios, we can see that the low industry growth portfolio underperforms significantly on a risk-adjusted basis, while the high industry analyst dispersion portfolio does not underperforms significantly. Overall, the change in abnormal return is monotonic across portfolios.

Panel B presents results that are very similar to those in Panel A. The high minus low IGROW hedge portfolio profit is slightly larger in magnitude for value-weighted portfolios than equal-weighted portfolios. The high industry growth portfolio earns about 34% (0.95×36) more than the low industry growth portfolio. This finding again suggests that this effect is not only driven by small IPOs.

5.1 Bubble Period

Ritter and Welch (2002) find calendar-time test for the bubble period is sensitive to the months chosen. We realize that calendar-time regression may not be appropriate for the bubble period, but present this test anyway for completeness. For the 3-year performance of IPOs during the bubble period (1999-2000), we form monthly calendar-time portfolio during 2000 and 2002. Therefore, we have 36 monthly observations for the calendar-time regressions for bubble period IPOs.

Table 10 reports the results of the calendar-time regressions for IPOs in the bubble period, the intercepts of which can be interpreted as the risk-adjusted monthly abnormal returns for the 3-year holding period. Despite the large magnitude of the industry growth effect on long-run returns, calendar-time regressions do not show a significant high minus low IGROW hedge portfolio return, judging from the t-statistics of either equal-weighed or value-weighted portfolios. However, to the extent that the high minus low IGROW hedge portfolio returns are highly negative, with point estimates larger in magnitude than those for the non-bubble period, the evidence is still in line with the event-time tests documented in Section 4.

6. Discussion

The information asymmetry or risk hypothesis may play a role for the short-run price effect, but it cannot explain the long-run evidence. The strong association between industry growth and long-run IPO performance suggests that IPO participants do not fully understand the information content of industry growth prospects. The evidence points to a general IPO investor tendency to underreact to growth prospects in normal times, and a tendency to overreact to the same information during the bubble period.

The empirical results show that our industry earnings growth rate measure, constructed by aggregating analyst long-term earnings forecasts at the industry level, has a substantial effect on IPO stock performance. In normal times, this industry growth measure positively predicts long-run IPO performance, suggesting that while analyst long-term forecasts may be subject to biases (e.g., La Porta (1996)), these forecasts do provide useful information about an industry's growth potential.

The finding that the divergence of opinion hypothesis does not explain IPO stock performance may be somewhat surprising, especially given the prior literature that tests the Miller (1977) hypothesis and often finds support of this theory. We discuss this finding below.

A body of literature has emerged that challenges the efficiency of the market in setting the aftermarket price: instead of the offer price being set low by the underwriters or issuer, it is possible that the first-day closing price is set too high by market participants. For example, Purnanandam and Swaminathan (2004) document that IPO prices are overvalued relative to intrinsic values, and that more overvalued IPOs tend to underperform both the market and other IPO firms for up to five years after the offer. Using European IPO samples, Derrien (2005), Cornelli, Goldreich and Ljungqvist (2006), and Dorn (2007) find evidence consistent with investors overvaluing IPOs in the short-run and this overvaluation leading to underperformance in the longer-run.

The Miller (1977) theory of divergence of opinion is often cited to explain the initial price jump and long-run underperformance, which is exemplified by the bubble period IPOs. Empirically, there have been attempts to test the Miller theory. Houge, Loughran, Suchanek, and Yan (2001) use three opening-day proxies for uncertainty or divergence of opinion: the percentage opening spread, time of first trade, and flipping ratio to study first-day and long-run returns; Chemmanur and Krishnan (2009) use aftermarket trading volume and share turnover as proxies for heterogeneous beliefs. Gao, Mao, and Zhong (2006) use aftermarket IPO return volatility to study long-run performance. Miller and Reilly (1987) and Ritter (1984, 1987) use aftermarket trading volume or volatility to study the initial returns. However, all these studies use *ex post* measures which rely on information available only after the IPO issuance and therefore are not able to examine the impact of investor heterogeneity on first-day returns. The information right after the IPO may reflect investor reaction to the offer price and first-day returns, in addition to (or instead of) the inherent uncertainty of the IPO. In other words, the causation may run from the offer price and first-day returns to aftermarket trading behavior.

In contrast, our measure (IDISP) is an *ex ante* proxy for the dispersion of belief about industry growth prospects. Furthermore, we control for the mean forecast level (IGROW) in our multivariate tests, which offers a way to isolate the mean growth forecast from the dispersion of growth forecast effects. When we omit IGROW and only include IDISP in the long-run return returns, we find (untabulated) that IDISP has a negative effect on BHARs in the non-bubble periods. This shows that omitting the mean growth variable in the regression may be a partial reason why prior literature mentioned above finds support for the divergence of opinion hypothesis.

One reason that divergence of opinion may not drive IPO performance as the Miller theory predicts is that the Miller theory assumes that investors have unbiased mean assessment about the true value of a stock. In reality, if investors' mean assessment deviates from the fundamental value as a result of overall investor sentiment, as occurred in the bubble period, the divergence of opinion effect may be dominated by the mean sentiment effect (see Cen, Lu, and Yang (2011)).

A criticism of IDISP is that it only reflects belief dispersion at the aggregate industry level, and a firm-level divergence of opinion measure may be needed to test the theory. To address this point, we offer the following observations. First, IDISP should be at least positively correlated with the "true" belief dispersion about IPOs. We find that during the bubble period, the 1-year BHAR shows a positive High – Low IDISP spread (untabulated), which is inconsistent with the Miller hypothesis. Second, the overall observation that the mean BHARs in non-bubble periods are positive suggests that the divergence of opinion effect, if any, should be on average dominated by other effects. Furthermore, in untabulated tests, we sort our sample firms into high and low IGROW portfolios based on median IGROW, and find that among IPOs with high IGROW, all portfolios sorted by IDISP (similar to the sorts in Table 5) have positive long-run abnormal returns. Regardless of what measures of belief dispersion we use, the Miller effect should not drive these patterns. Finally, we note that IGROW, also an industry-level measure, completely dominates IDISP in multivariate regressions, reinforcing the conclusion that divergence of opinion seems to be dominated by the industry growth effect.

7. Conclusion

Using industry earnings growth forecast as a proxy for IPO growth potential, we document a strong association between industry growth prospects and IPO stock performance. IPOs in high growth industries substantially outperform in the three years after the offer, except in the internet bubble period of 1999-2000, when this relationship reverses. In both the non-bubble and bubble periods, there is a positive relation between industry growth prospects and short-run price performance. For both the short-run and long-run returns, and for both periods, the industry growth effects are stronger when returns are value-weighted, suggesting that the effects are larger for larger IPOs which presumably are more representative of their industries.

We investigate the interpretation of the findings in the frameworks of three hypotheses: information asymmetry/risk, under- or overreaction, and divergence of opinion. The evidence is most consistent with investors' tendency to underreact to growth prospects of the IPO in normal times, and their tendency to overreact to the same information during a pronounced market bubble. The information asymmetry or risk hypothesis may be at work for the short-run price effect, but it cannot explain the long-run evidence. Finally, the divergence of opinion hypothesis does not appear to explain IPO stock performance, even for the bubble period.

The industry growth effect on IPO performance is substantial in economic terms. In fact, we have documented that industry growth is the most significant driver of long-run IPO performance among all the factors that we consider, including underwriter quality measures and offer proceeds. Given the magnitude of the effect of this intuitive measure, further investigation of industry growth prospects may provide insights into other aspects of the IPO process.

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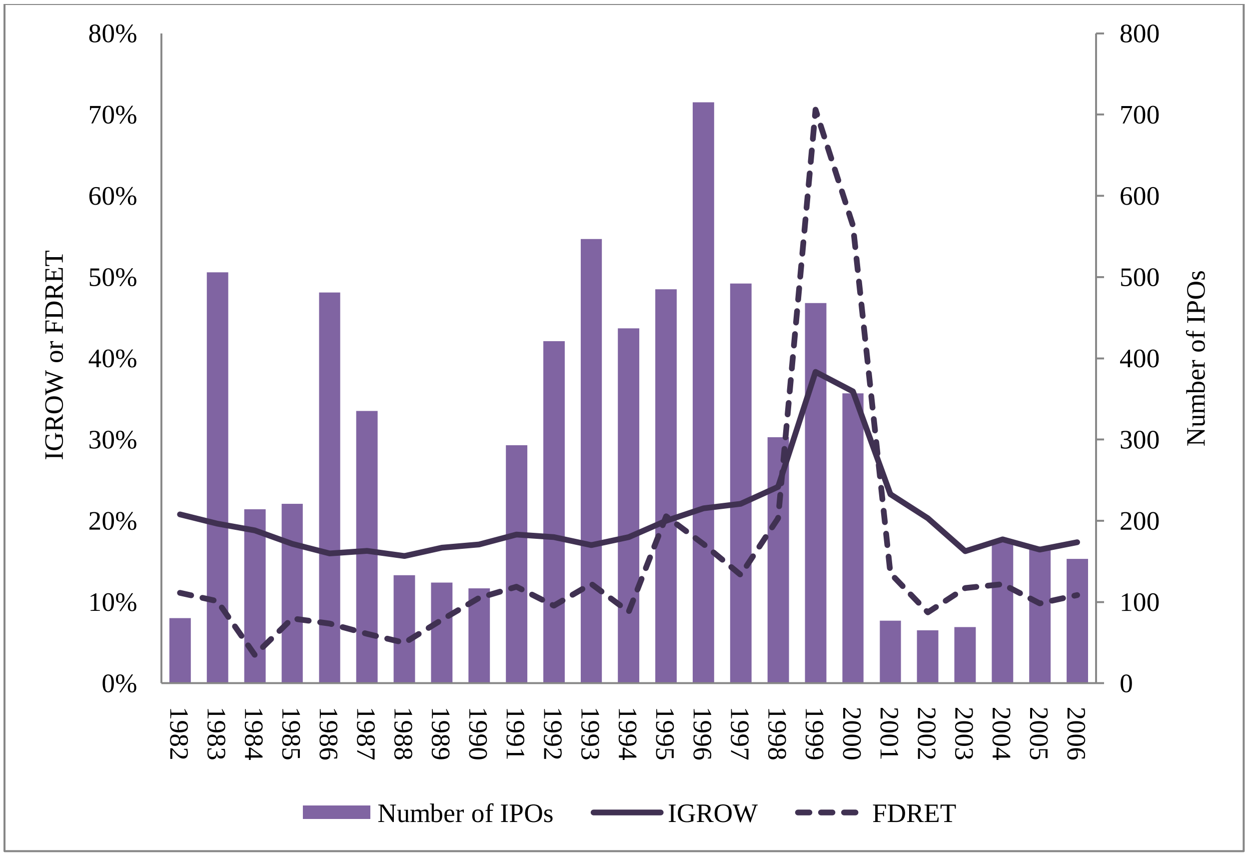


Figure 1: Average Monthly Industry Growth, First-Day Returns and Number of IPOs

This figure plots the average monthly IGROW, FDRET and number of IPOs. IGROW is the average mean analyst long-term earnings growth forecast in the IPO firm's industry in the month prior to the offer. FDRET is the percentage increase in the first trading day closing market price from the offer price. The sample includes IPOs from 1982 to 2006.

Panel A: Non-Bubble Periods

Panel B: Bubble Period

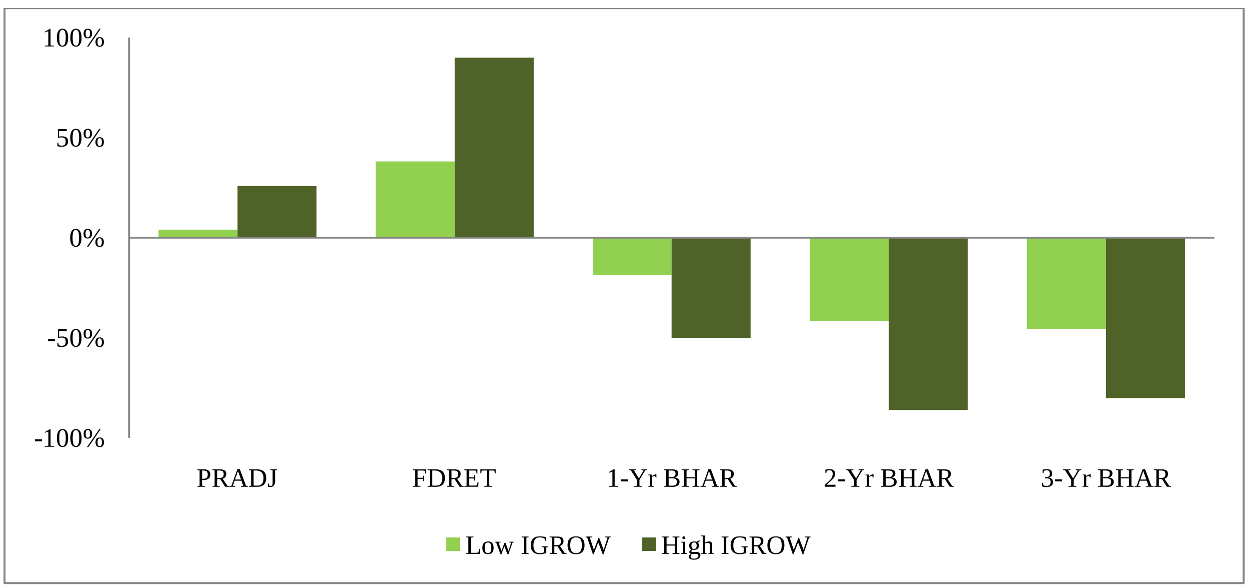
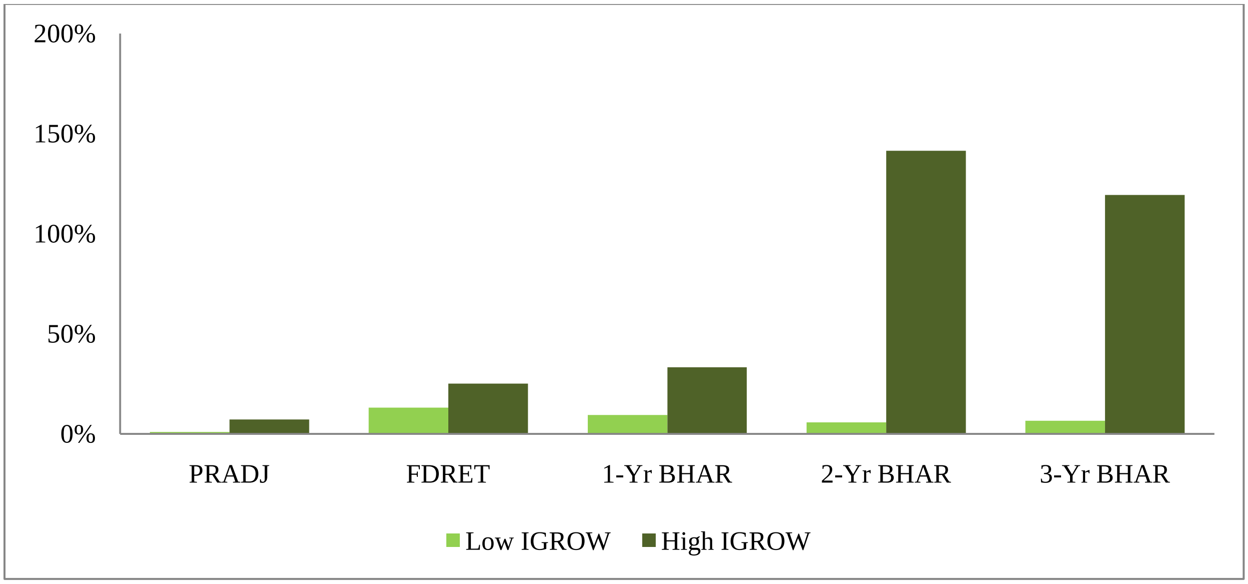


Figure 2: Equal-Weighted Returns of Low and High Industry Growth IPO Portfolios

This figure plots the equal-weighted returns of low and high IGROW portfolios. Panel A examines Non-Bubble period IPOs, while Panel B examines Bubble period IPOs. The portfolios are constructed by allocating IPOs to low, medium or high IGROW portfolios as they become public. The IPOs remain in their respective portfolios for up to 3 years after which time they drop out. IGROW is the average mean analyst long-term earnings growth forecast in the IPO firm's industry in the month prior to the offer. PRADJ is the percentage increase in the offer price from the file price. FDRET is the percentage increase in the first trading day closing market price from the offer price. Style-adjusted buy-and-hold abnormal returns (BHARs) are calculated put as the difference between the IPO's buy-and-hold return and the buy-and-hold return from an equal-weighted portfolio matched on size and book-to-market. The sample includes IPOs from 1982 to 2006. The bubble period is defined as the 1999-2000 period.

Panel A: Non-Bubble Periods

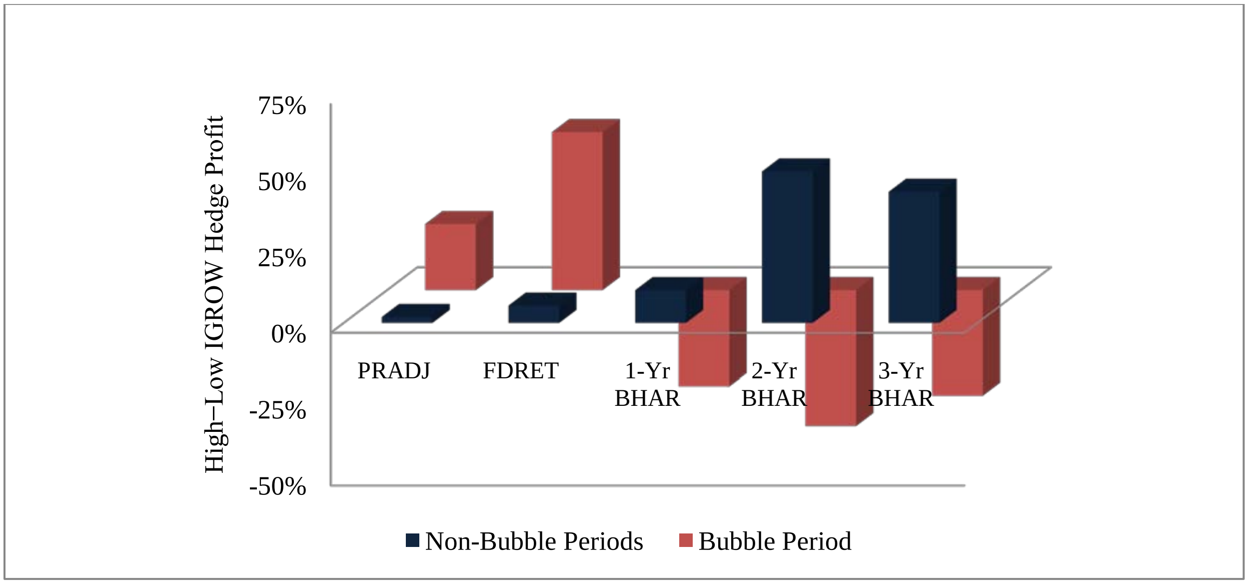


Panel B: Bubble Periods

Figure 3: Value-Weighted Returns of Low and High Industry Growth IPO Portfolios

This figure plots the value-weighted returns of low and high IGROW portfolios. Panel A examines Non-Bubble period IPOs, while Panel B examines Bubble period IPOs. The portfolios are constructed by allocating IPOs to low, medium or high IGROW portfolios as they become public. The IPOs remain in their respective portfolios for up to 3 years after which time they drop out. IGROW is the average mean analyst long-term earnings growth forecast in the IPO firm's industry in the month prior to the offer. PRADJ is the percentage increase in the offer price from the file price. FDRET is the percentage increase in the first trading day closing market price from the offer price. Style-adjusted buy-and-hold abnormal returns (BHARs) are calculated put as the difference between the IPO's buy-and-hold return and the buy-and-hold return from an equal-weighted portfolio matched on size and book-to-market. The sample includes IPOs from 1982 to 2006. The bubble period is defined as the 1999-2000 period.

Panel A: Equal-Weighted Portfolios



Panel B: Value-Weighted Portfolios

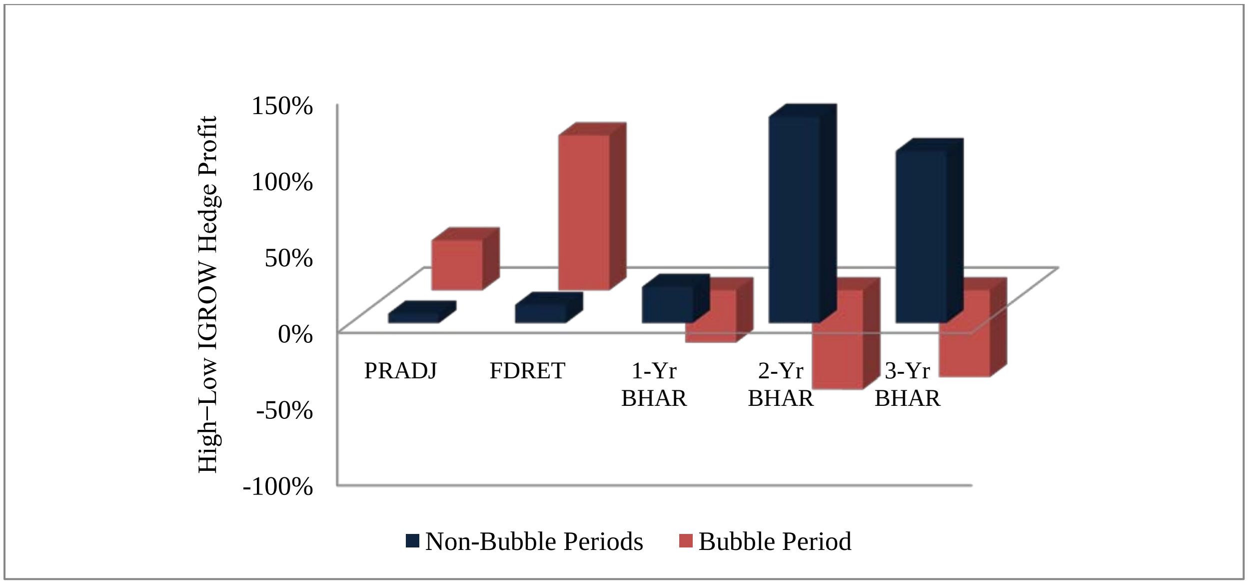


Figure 4: Returns of the High minus Low Industry Growth IPO Hedge Portfolio

This figure plots the returns of the High–Low IGROW hedge portfolio. Panel A examines the equal -weighted portfolio, while Panel B examines the value-weighted portfolio. The portfolios are constructed by allocating IPOs to low, medium or high IGROW portfolios as they become public. The IPOs remain in their respective portfolios for up to 3 years after which time they drop out. IGROW is the average mean analyst long-term earnings growth forecast in the IPO firm's industry in the month prior to the offer. PRADJ is the percentage increase in the offer price from the file price. FDRET is the percentage increase in the first trading day closing market price from the offer price. Style-adjusted buy-and-hold abnormal returns (BHARs) are calculated put as the difference between the IPO's buy-and-hold return and the buy-and-hold return from an equal-weighted portfolio matched on size and book-to-market. The sample includes IPOs from 1982 to 2006. The bubble period is defined as the 1999-2000 period.

Table 1: Summary Statistics of Analyst Forecast, Firm, Offer and Market Characteristics: Full Sample

IGROW is the average mean analyst long-term earnings growth forecast in the IPO firm's industry in the month prior to the offer. IDISP is the average standard deviation of analyst long-term earnings growth forecasts divided by the absolute value of mean analyst long-term earnings growth forecast in the IPO firm's industry in the month prior to the offer. TECH equals 1 if the firm is in a high-tech industry, and 0 otherwise. INTERNET is equal to 1 when the IPO is issued by an internet company, and 0 otherwise. EPROCEEDS is the expected amount to be raised in the offering (file price x file shares) in millions of 2006 dollars. AGE is the number of years between the IPO date and the company's founding date. UWREP is the average Carter and Manaster (1990) underwriter rating of all lead underwriters in the IPO. NMGR is the number of managing underwriters in the syndicate. VENTURE is equal to 1 when the IPO is VC-backed, and 0 otherwise. The market value of equity, MV, is the number of shares outstanding times the close price on the first day of trading, in millions of 2006 dollars. BV is the book value of equity after the offer. PRADJ is the percentage increase in the offer price from the file price. FDRET is the percentage increase in the first trading day closing market price from the offer price. Style-adjusted buy-and-hold abnormal returns (BHARs) are calculated as the difference between the IPO's buy-and-hold return and the buy-and-hold return from an equal-weighted portfolio matched on size and book-to-market. The sample includes IPOs from 1982 to 2006.

Variables	N	Mean	Std Dev	Median	Min	Max
Panel A: Industry, Firm and Offer Characteristics						
IGROW (%)	7434	20.93	9.39	18.96	4.65	56.32
IDISP (%)	7434	24.37	10.08	22.47	0.00	275.91
TECH	7434	0.45	0.50	0.00	0.00	1.00
INTERNET	7434	0.07	0.25	0.00	0.00	1.00
EPROCEEDS	7333	82.25	222.08	40.17	0.82	9045.40
AGE	7170	16.09	21.98	8.00	0.00	165.00
UWREP	6600	7.09	2.20	8.00	0.00	9.00
NMGR	7434	2.35	1.50	2.00	1.00	28.00
VENTURE	7434	0.36	0.48	0.00	0.00	1.00
MV	7434	409.87	1434.69	133.78	0.00	63007.63
BV/MV	6145	0.44	0.98	0.31	−3.17	54.12
Panel B: Market Characteristics						
PRADJ (%)	7406	−0.27	21.55	0.00	−98.44	344.44
FDRET (%)	7434	17.61	39.55	6.25	−57.50	697.50
BHAR 1-Yr (%)	6040	−0.36	111.76	−16.77	−297.16	2673.93
BHAR 2-Yr (%)	6040	6.28	387.97	−36.72	−340.51	22355.66
BHAR 3-Yr (%)	6040	4.81	410.95	−50.64	−437.11	17608.61

Table 2: Yearly Summary Statistics of Analyst Forecast, Offer and Market Characteristics

N is the number of IPOs. IGROW is the average mean analyst long-term earnings growth forecast in the IPO firm's industry in the month prior to the offer. IDISP is the average standard deviation of analyst long-term earnings growth forecasts divided by the absolute value of mean analyst long-term earnings growth forecast in the IPO firm's industry in the month prior to the offer. TECH equals 1 if the firm is in a high-tech industry, and 0 otherwise. INTERNET is equal to 1 when the IPO is issued by an internet company, and 0 otherwise. PRADJ is the percentage increase in the offer price from the file price. FDRET is the percentage increase in the first trading day closing market price from the offer price. Style-adjusted buy-and-hold abnormal returns (BHARs) are calculated as the difference between the IPO's buy-and-hold return and the buy-and-hold return from an equal-weighted portfolio matched on size and book-to-market. The sample includes IPOs from 1982 to 2006.

								BHAR (%)		
Year	N	IGROW (%)	IDISP (%)	TECH	INTERNET	PRADJ (%)	FDRET (%)	1-Yr	2-Yr	3-Yr
1982	80	20.77	20.01	0.51	0.00	−3.35	11.12	37.80	−19.87	−1.32
1983	506	19.65	21.98	0.36	0.00	−3.18	10.10	−0.50	8.61	24.06
1984	214	18.81	20.67	0.34	0.00	−11.79	3.50	19.74	45.40	30.54
1985	221	17.15	25.03	0.23	0.00	−3.29	7.98	11.90	−5.46	−10.29
1986	481	15.97	32.12	0.23	0.00	−4.13	7.34	−5.48	−7.96	−2.95
1987	335	16.28	32.31	0.25	0.00	−4.58	6.08	−5.98	2.66	0.22
1988	133	15.67	28.81	0.28	0.00	−5.31	4.99	10.28	−0.41	1.49
1989	124	16.70	27.74	0.35	0.00	−0.04	7.81	2.64	11.58	6.90
1990	117	17.07	26.43	0.35	0.01	0.37	10.50	−17.98	−29.21	−52.86
1991	293	18.31	24.02	0.46	0.00	1.11	11.88	−3.48	−14.99	−14.12
1992	421	17.97	22.91	0.40	0.01	−3.32	9.54	2.99	−3.32	−7.64
1993	547	17.01	24.00	0.35	0.00	0.69	12.23	−5.12	−13.60	−11.96
1994	437	18.00	23.08	0.39	0.00	−5.49	8.82	10.74	39.54	9.20
1995	485	20.00	19.94	0.53	0.02	4.78	20.56	0.64	−13.26	−15.84
1996	715	21.53	20.99	0.53	0.02	0.02	17.14	−6.68	−3.24	46.86
1997	492	22.10	20.99	0.47	0.03	−1.93	13.32	10.34	93.12	88.42
1998	303	24.18	20.37	0.46	0.11	−1.33	20.30	48.17	144.77	21.05
1999	468	38.34	25.80	0.78	0.50	17.22	70.59	−26.70	−73.01	−73.60
2000	357	35.91	24.55	0.85	0.35	12.49	56.35	−40.66	−44.65	−43.17
2001	77	23.28	25.91	0.57	0.08	−1.97	13.55	−9.18	−6.04	64.03
2002	65	20.32	26.02	0.48	0.03	−6.75	8.72	−6.05	4.09	5.12
2003	69	16.26	31.41	0.48	0.04	2.98	11.74	8.51	−4.07	−11.04
2004	175	17.71	28.42	0.53	0.07	−6.86	12.19	4.71	6.72	11.82
2005	166	16.44	27.99	0.43	0.07	−5.24	9.84	5.48	7.87	10.97
2006	153	17.35	29.36	0.44	0.11	−4.27	10.85	2.99	−1.92	−8.54
All	7434	20.93	24.37	0.45	0.07	−0.27	17.61	−0.36	6.28	4.81
Non-Bubble	6609	18.89	24.26	0.41	0.02	−2.20	11.77	4.05	15.55	13.83
Bubble	825	37.29	25.26	0.81	0.44	15.19	64.43	−32.50	−61.22	−60.95

Table 3: Summary Characteristics of Industry Growth Portfolios

We sort the sample firms into 3 IGROW portfolios. IGROW is the average mean analyst long-term earnings growth forecast in the IPO firm's industry in the month prior to the offer. IDISP is the average standard deviation of analyst long-term earnings growth forecasts divided by the absolute value of mean analyst long-term earnings growth forecast in the IPO firm's industry in the month prior to the offer. TECH equals 1 if the firm is in a high-tech industry, and 0 otherwise. INTERNET is equal to 1 when the IPO is issued by an internet company, and 0 otherwise. EPROCEEDS is the expected amount to be raised in the offering (file price x file shares) in millions of 2006 dollars. AGE is the number of years between the IPO date and the company's founding date. UWREP is the average Carter and Manaster (1990) underwriter rating of all lead underwriters in the IPO. NMGR is the number of managing underwriters in the syndicate. VENTURE is equal to 1 when the IPO is VC-backed, and 0 otherwise. The market value of equity, MV, is the number of shares outstanding times the close price on the first day of trading, in millions of 2006 dollars. BV is the book value of equity after the offer. The numbers in parentheses are t-statistics based on simple t-tests for differences in means. ***, ** or * signify that the t-statistic is significant at the 1, 5 or 10% level, respectively. The sample includes IPOs from 1982 to 2006.

	IGROW (%)	IDISP (%)	TECH	INTERNET	EPROCEEDS	AGE	UWR	NMGR	VENTURE	MV	BV/MV
Panel A: All Periods											
Low IGROW	14.54	27.30	0.13	0.00	111.37	24.49	7.14	2.43	0.18	441.90	0.64
Mid IGROW	19.28	23.24	0.42	0.00	78.42	15.29	7.07	2.32	0.34	361.01	0.38
High IGROW	28.51	22.74	0.77	0.19	59.11	9.25	7.06	2.30	0.54	427.77	0.31
High−Low IGROW	13.96***	−4.56***	0.64***	0.19***	−52.25***	−15.24***	−0.08	−0.13***	0.36***	−14.13	−0.34***
	(57.11)	(−14.83)	(58.88)	(23.55)	(−7.55)	(−24.19)	(−1.25)	(−2.95)	(28.11)	(−0.36)	(−9.16)
All IPOs	20.93	24.37	0.45	0.07	82.25	16.09	7.09	2.35	0.36	409.87	0.44
Panel B: Non-Bubble Periods											
Low IGROW	13.71	27.74	0.08	0.00	100.27	25.40	7.06	2.28	0.16	329.61	0.68
Mid IGROW	18.51	23.20	0.38	0.00	75.45	15.80	6.98	2.23	0.32	291.92	0.39
High IGROW	24.32	22.02	0.75	0.06	54.25	9.90	6.91	2.11	0.51	238.27	0.34
High−Low IGROW	10.61***	−5.71***	0.67***	0.06***	−46.01***	−15.50***	−0.15**	−0.17***	0.36***	−91.34***	−0.35***
	(83.16)	(−16.51)	(60.40)	(11.15)	(−6.71)	(−22.37)	(−2.12)	(−3.89)	(26.73)	(−3.83)	(−8.22)
All IPOs	18.89	24.26	0.41	0.02	76.31	16.84	6.98	2.21	0.33	286.30	0.46
Panel C: Bubble Period											
Low IGROW	21.17	23.86	0.57	0.00	198.03	17.57	7.74	3.60	0.42	1332.19	0.37
Mid IGROW	28.89	23.84	0.92	0.00	115.13	9.14	8.09	3.37	0.64	1224.35	0.25
High IGROW	53.00	26.96	0.93	0.97	87.54	5.56	7.93	3.43	0.73	1535.27	0.17
High−Low IGROW	31.82***	3.11***	0.37***	0.97***	−110.49***	−12.01***	0.19	−0.17	0.31***	203.08	−0.21***
	(86.83)	(9.27)	(12.28)	(89.48)	(−4.14)	(−8.80)	(1.31)	(−1.53)	(8.29)	(0.82)	(−8.78)
All IPOs	37.29	25.26	0.81	0.44	129.53	10.22	7.91	3.47	0.61	1399.82	0.25

Table 4: Short and Long-Run Returns of Industry Growth Portfolios: Full Sample

Sample firms are sorted into 3 IGROW portfolios. IGROW is the average mean analyst long-term earnings growth forecast in the IPO firm's industry in the month prior to the offer. Style-adjusted buy-and-hold abnormal returns (BHARs) are calculated as the difference between the IPO's buy-and-hold return and the buy-and-hold return from an equal-weighted portfolio matched on size and book-to-market. The numbers in parentheses are t-statistics based on simple t-tests for differences in means. The numbers in brackets are empirical p-values based on observed significance levels from a randomization procedure designed to control for clustering, autocorrelation, and skewness of the original sample under the null hypothesis. ***, ** or * signify that the t-statistic is significant at the 1, 5 or 10% level, respectively. The sample includes IPOs from 1982 to 2006. The bubble period is defined as the 1999-2000 period.

	PRADJ (%)	FDRET (%)	1-Yr BHAR (%)	2-Yr BHAR (%)	3-Yr BHAR (%)
Panel A: Equal-Weighted Portfolios					
Low IGROW	−2.27	12.35	−3.02	−7.85	−7.74
Mid IGROW	−1.48	14.29	1.13	−0.67	−0.93
High IGROW	2.77	25.77	0.61	26.06	21.94
High−Low IGROW	5.04***	13.42***	3.63	33.91**	29.68**
	(7.92)	(10.86)	(0.95)	(2.30)	(1.94)
	[0.00]	[0.00]	[0.36]	[0.01]	[0.06]
All IPOs	−0.27	17.61***	−0.36	6.28	4.81
Panel B: Value-Weighted Portfolios					
Low IGROW	9.83	35.92	0.68	−4.56	−3.84
Mid IGROW	19.93	44.61	−6.16	−6.59	−1.74
High IGROW	34.86	107.65	−10.54	18.18	12.66
High−Low IGROW	25.03***	71.73***	−11.22**	22.74	16.50
	(20.95)	(22.35)	(−2.40)	(1.28)	(1.11)
	[0.00]	[0.00]	[0.29]	[0.48]	[0.58]
All IPOs	21.77***	64.20***	−5.50***	3.58	3.05

Table 5: Short and Long-Run Returns of Industry Growth Portfolios: Non-Bubble Periods
Sample firms are sorted into 3 IGROW portfolios. IGROW is the average mean analyst long-term earnings growth forecast in the IPO firm's industry in the month prior to the offer. Style-adjusted buy-and-hold abnormal returns (BHARs) are calculated as the difference between the IPO's buy-and-hold return and the buy-and-hold return from an equal-weighted portfolio matched on size and book-to-market. The numbers in parentheses are t-statistics based on simple t-tests for differences in means. The numbers in brackets are empirical p-values based on observed significance levels from a randomization procedure designed to control for clustering, autocorrelation, and skewness of the original sample under the null hypothesis. ***, ** or * signify that the t-statistic is significant at the 1, 5 or 10% level, respectively. The sample includes IPOs from 1982 to 2006. The bubble period is defined as the 1999-2000 period.

	PRADJ (%)	FDRET (%)	1-Yr BHAR (%)	2-Yr BHAR (%)	3-Yr BHAR (%)
Panel A: Equal-Weighted Portfolios					
Low IGROW	−3.06	9.11	−0.81	−3.05	−2.34
Mid IGROW	−2.43	11.32	2.82	2.86	2.97
High IGROW	−1.11	14.82	9.98	46.78	40.81
High−Low IGROW	1.94***	5.71***	10.78***	49.83***	43.15***
	(3.48)	(8.50)	(3.09)	(2.92)	(2.44)
	[0.00]	[0.00]	[0.00]	[0.00]	[0.01]
All IPOs	−2.20***	11.77***	4.05***	15.55***	13.83**
Panel B: Value-Weighted Portfolios					
Low IGROW	0.97	13.03	9.38	5.74	6.50
Mid IGROW	5.26	17.22	2.63	7.89	12.25
High IGROW	7.24	25.09	33.24	141.34	119.39
High−Low IGROW	6.27***	12.06***	23.86***	135.60***	112.89***
	(10.18)	(12.82)	(5.39)	(5.22)	(5.20)
	[0.00]	[0.00]	[0.01]	[0.00]	[0.01]
All IPOs	4.22***	17.84***	13.94***	46.13***	41.54***

Table 6: Short and Long-Run Returns of Industry Growth Portfolios: Bubble Period

Sample firms are sorted into 3 IGROW portfolios. IGROW is the average mean analyst long-term earnings growth forecast in the IPO firm's industry in the month prior to the offer. Style-adjusted buy-and-hold abnormal returns (BHARs) are calculated as the difference between the IPO's buy-and-hold return and the buy-and-hold return from an equal-weighted portfolio matched on size and book-to-market. The numbers in parentheses are t-statistics based on simple t-tests for differences in means. The numbers in brackets are empirical p-values based on observed significance levels from a randomization procedure designed to control for clustering, autocorrelation, and skewness of the original sample under the null hypothesis. ***, ** or * signify that the t-statistic is significant at the 1, 5 or 10% level, respectively. The sample includes IPOs from 1982 to 2006. The bubble period is defined as the 1999-2000 period.

	PRADJ (%)	FDRET (%)	1-Yr BHAR (%)	2-Yr BHAR (%)	3-Yr BHAR (%)
Panel A: Equal-Weighted Portfolios					
Low IGROW	3.95	38.05	−18.56	−41.59	−45.68
Mid IGROW	10.39	51.36	−18.04	−40.63	−45.14
High IGROW	25.66	89.80	−50.09	−86.11	−80.21
High−Low IGROW	21.71***	51.75***	−31.53*	−44.51***	−34.53***
	(7.67)	(7.13)	(−1.92)	(−4.50)	(−3.22)
	[0.00]	[0.00]	[0.05]	[0.00]	[0.00]
All IPOs	15.19***	64.43***	−32.50***	−61.22***	−60.95***
Panel B: Value-Weighted Portfolios					
Low IGROW	27.39	80.81	−13.18	−20.96	−20.31
Mid IGROW	63.58	126.20	−36.69	−56.88	−50.37
High IGROW	60.31	182.53	−47.51	−85.82	−77.47
High−Low IGROW	32.92***	101.72***	−34.33***	−64.86***	−57.16***
	(7.99)	(8.90)	(−2.48)	(−9.35)	(−7.91)
	[0.00]	[0.02]	[0.05]	[0.00]	[0.00]
All IPOs	50.83***	140.15***	−34.56***	−60.05***	−54.51***

Table 7: Regressions of Price Adjustment and First-Day Returns on Industry Growth and Control Variables

IGROW is the average mean analyst long-term earnings growth forecast in the IPO firm's industry in the month prior to the offer. IDISP is the average standard deviation of analyst long-term earnings growth forecasts divided by the absolute value of mean analyst long-term earnings growth forecast in the IPO firm's industry in the month prior to the offer. EPROCEEDS is the expected amount to be raised in the offering (file price x file shares) in millions of 2006 dollars. AGE is the number of years between the IPO date and the company's founding date. UWREP is the average Carter and Manaster (1990) underwriter rating of all lead underwriters in the IPO. NMGR is the number of managing underwriters in the syndicate. VENTURE is equal to 1 when the IPO is VC-backed, and 0 otherwise. PRADJ is the percentage increase in the offer price from the file price. FDRET is the percentage increase in the first trading day closing market price from the offer price. BUBBLE is equal to 1 when the IPO is issued in the year 1999 or 2000, and 0 otherwise. The numbers in parentheses are heteroscedasticity consistent t-statistics. ***, ** or * signify that the t-statistic is significant at the 1, 5 or 10% level, respectively. The sample includes IPOs from 1982 to 2006.

	All Periods		Non-Bubble Periods		Bubble Period	
	PRADJ	FDRET	PRADJ	FDRET	PRADJ	FDRET
IGROW	0.27***	0.64***	0.28***	0.72***	0.58***	1.29***
	(4.64)	(4.28)	(4.82)	(4.76)	(5.78)	(6.45)
IGROW × BUBBLE	0.41***	0.97***				
	(4.08)	(4.01)				
BUBBLE	−4.88	0.23				
	(−1.47)	(0.03)				
IDISP	−0.07***	−0.08**	−0.08***	−0.08**	0.39	0.37
	(−3.19)	(−2.26)	(−3.49)	(−2.37)	(1.15)	(0.68)
Ln(1+AGE)	−0.49**	−1.71***	−0.48**	−1.25***	0.13	−5.22
	(−2.12)	(−5.50)	(−2.28)	(−5.50)	(0.07)	(−1.63)
UWREP	1.24***	1.39***	0.99***	0.38**	4.41***	14.43***
	(8.69)	(6.08)	(7.14)	(2.11)	(5.25)	(7.06)
Ln(NMGR)	3.77***	4.46***	3.40***	3.89***	6.56	3.96
	(5.72)	(5.32)	(5.35)	(6.16)	(1.57)	(0.41)
VENTURE	−0.30	2.00*	−0.59	0.03	0.48	9.35
	(−0.51)	(1.87)	(−1.03)	(0.03)	(0.18)	(1.47)
Ln(EPROCEEDS)	−2.84***	−3.37***	−2.24***	−1.90***	−9.34**	−17.70***
	(−5.60)	(−6.92)	(−5.89)	(−5.71)	(−2.19)	(−4.19)
Intercept	−4.91***	4.49	−5.03***	4.70	−19.85*	−32.67*
	(−2.59)	(1.17)	(−2.80)	(1.24)	(−1.69)	(−1.75)
Adj. R^2	0.105	0.243	0.028	0.064	0.115	0.146
N	6314	6314	5595	5595	719	719

Table 8: Regressions of Style-Adjusted Returns on Industry Growth and Control Variables

The dependent variable is the style-adjusted buy-and-hold abnormal return (BHAR), calculated as the difference between the IPO's buy-and-hold return and the buy-and-hold return from an equal-weighted portfolio matched on size and book-to-market. IGROW is the average mean analyst long-term earnings growth forecast in the IPO firm's industry in the month prior to the offer. IDISP is the average standard deviation of analyst long-term earnings growth forecasts divided by the absolute value of mean analyst long-term earnings growth forecast in the IPO firm's industry in the month prior to the offer. EPROCEEDS is the expected amount to be raised in the offering (file price x file shares) in millions of 2006 dollars. AGE is the number of years between the IPO date and the company's founding date. UWREP is the average Carter and Manaster (1990) underwriter rating of all lead underwriters in the IPO. NMGR is the number of managing underwriters in the syndicate. VENTURE is equal to 1 when the IPO is VC-backed, and 0 otherwise. The market value of equity, MV, is the number of shares outstanding times the close price on the first day of trading, in millions of 2006 dollars. BV is the book value of equity after the offer. BUBBLE is equal to 1 when the IPO is issued in the year 1999 or 2000, and 0 otherwise. The numbers in parentheses are heteroscedasticity consistent t-statistics. ***, ** or * signify that the t-statistic is significant at the 1, 5 or 10% level, respectively. The sample includes IPOs from 1982 to 2006.

	All Periods			Non-Bubble Periods			Bubble Period		
	1-Yr	2-Yr	3-Yr	1-Yr	2-Yr	3-Yr	1-Yr	2-Yr	3-Yr
IGROW	2.31***	7.77***	7.84***	2.33***	7.44***	7.76***	−1.22*	−1.21***	−1.41*
	(3.06)	(3.37)	(2.75)	(3.06)	(3.34)	(2.67)	(−1.90)	(−2.61)	(−1.75)
IGROW × BUBBLE	−3.33***	−9.78***	−9.43***						
	(−3.69)	(−3.83)	(−3.29)						
BUBBLE	39.49*	117.10***	115.13**						
	(1.70)	(2.80)	(2.22)						
IDISP	−0.01	0.16	0.26	−0.03	0.10	0.21	1.76	1.93	2.32
	(−0.04)	(0.72)	(0.86)	(−0.21)	(0.46)	(0.69)	(0.93)	(1.04)	(0.62)
Ln(1+AGE)	0.07	−1.57	1.02	−0.77	−3.71	−1.12	12.28*	23.85***	24.74***
	(0.06)	(−0.47)	(0.24)	(−0.72)	(−1.04)	(−0.25)	(1.67)	(4.19)	(3.76)
UWREP	3.53***	14.26***	15.58***	3.18***	16.09***	17.03***	7.70	−2.00	−0.01
	(3.69)	(3.79)	(4.32)	(3.44)	(3.83)	(4.30)	(1.47)	(−0.35)	(−0.00)
Ln(NMGR)	11.68***	34.50***	35.54***	10.18***	37.72***	38.15***	32.55	−2.65	9.29
	(3.00)	(3.06)	(2.60)	(2.90)	(3.13)	(2.59)	(1.04)	(−0.12)	(0.41)
VENTURE	−2.97	8.68	−4.41	−4.02	9.78	−6.01	4.84	11.72	13.09
	(−0.89)	(1.31)	(−0.30)	(−1.34)	(1.29)	(−0.36)	(0.28)	(1.16)	(1.25)
Ln(EPROCEEDS)	−5.29**	−22.44***	−26.78***	−3.91**	−25.47***	−28.88***	−21.54	−2.68	−11.05
	(−2.40)	(−3.22)	(−3.18)	(−2.18)	(−3.22)	(−3.13)	(−1.35)	(−0.30)	(−0.73)
Ln(BV/MV)	−0.20	−6.60	−0.25	0.40	−10.02	0.09	−1.37	3.74	−7.63
	(−0.09)	(−0.66)	(−0.02)	(0.19)	(−0.82)	(0.01)	(−0.15)	(0.78)	(−1.28)
Intercept	−50.43***	−178.53***	−173.64***	−48.80***	−174.01***	−169.20***	−66.25	−81.27	−99.04
	(−2.77)	(−3.51)	(−3.41)	(−2.68)	(−3.42)	(−3.34)	(−1.21)	(−1.60)	(−1.35)
Adj. R^2	0.028	0.021	0.017	0.024	0.017	0.014	0.001	0.037	0.024
N	5138	5138	5138	4507	4507	4507	631	631	631

Table 9: 3-Year Calendar-Time 5-Factor Regressions for Industry Growth Portfolios: Non-Bubble Periods

This table reports the results of five-factor regressions involving equal-weighted (Panel A) or value-weighted (Panel B) monthly calendar-time returns of low, medium and high IGROW portfolios. The portfolios are constructed by allocating IPOs to low, medium or high IGROW portfolios as they become public. The IPOs remain in their respective portfolios for up to 3 years after which time they drop out. The regression model is given by: $R_{pt} - R_{ft} = a + b(R_{mt} - R_{ft}) + sSMB_t + hHML_t + mUMD_t + iINV_t + e_t$. R_{pt} is the monthly portfolio return. R_{ft} is the 1-month treasury bill return. R_{mt} is the monthly value-weighted return on all NYSE, AMEX, and Nasdaq stocks. SMB_t (Small Minus Big) is the average monthly return on the three small portfolios minus the average return on the three big portfolios. HML_t (High Minus Low) is the average monthly return on the two value portfolios minus the average return on the two growth portfolios. UMD_t is the average return on the two high prior return portfolios minus the average return on the two low prior return portfolios. INV_t is the investment factor from Lyandres, Sun and Zhang (2008). a are the portfolio's monthly intercepts in percent, and b, s, h, m and i are its factor loadings. The numbers in parentheses are t-statistics. ***, ** or * signify that the t-statistic is significant at the 1, 5 or 10% level, respectively. The sample includes IPOs from 1982 to 2006, excluding the bubble period (1999 and 2000). Returns are taken between 1983 and 2008 (312 observations) to allow for there to be sufficient firms in each portfolio.

	a	b	s	h	m	i	Adj. R^2
Panel A: Equal-Weighted Portfolios							
Low IGROW	−0.35**	1.01***	0.79***	0.50***	−0.15***	−0.05	78.7%
	(−2.21)	(26.16)	(15.69)	(7.93)	(−4.08)	(−0.56)	
Mid IGROW	0.02	1.07***	1.18***	−0.02	−0.25***	−0.23*	79.0%
	(0.10)	(20.30)	(17.25)	(−0.22)	(−5.06)	(−1.82)	
High IGROW	0.48*	1.19***	1.28***	−0.76***	−0.50***	−0.25*	82.7%
	(1.87)	(19.11)	(15.82)	(−7.49)	(−8.46)	(−1.70)	
High−Low IGROW	0.83***	0.18***	0.49***	−1.25***	−0.35***	−0.20	60.1%
	(3.16)	(2.77)	(5.91)	(−12.12)	(−5.78)	(−1.32)	
All IPOs	0.05	1.09***	1.08***	−0.09	−0.30***	−0.18*	86.2%
	(0.30)	(26.60)	(20.34)	(−1.40)	(−7.74)	(−1.84)	
Panel B: Value-Weighted Portfolios							
Low IGROW	−0.25	1.06***	0.30***	0.35***	0.15***	−0.17*	69.7%
	(−1.39)	(23.92)	(5.26)	(4.83)	(3.56)	(−1.65)	
Mid IGROW	0.27	1.20***	0.82***	−0.29***	0.11**	−0.44***	83.4%
	(1.39)	(25.38)	(13.34)	(−3.73)	(2.46)	(−3.98)	
High IGROW	0.70***	1.24***	0.71***	−1.06***	−0.04	−0.57***	81.6%
	(2.74)	(19.79)	(8.74)	(−10.40)	(−0.69)	(−3.87)	
High−Low IGROW	0.95***	0.18**	0.41***	−1.41***	−0.19**	−0.40**	53.4%
	(2.99)	(2.26)	(4.01)	(−11.10)	(−2.58)	(−2.17)	
All IPOs	0.11	1.17***	0.64***	−0.50***	0.14***	−0.26***	89.0%
	(0.75)	(32.18)	(13.47)	(−8.43)	(3.98)	(−3.04)	

Table 10: 3-Year Calendar-Time 5-Factor Regressions for Industry Growth Portfolios: Bubble Period

This table reports the results of five-factor regressions involving equal-weighted (Panel A) or value-weighted (Panel B) monthly calendar-time returns of low, medium and high IGROW portfolios. The portfolios are constructed by allocating IPOs to low, medium or high IGROW portfolios as they become public. The IPOs remain in their respective portfolios for up to 3 years after which time they drop out. The regression model is given by: $R_{pt} - R_{ft} = a + b(R_{mt} - R_{ft}) + sSMB_t + hHML_t + mUMD_t + iINV_t + e_t$. R_{pt} is the monthly portfolio return. R_{ft} is the 1-month treasury bill return. R_{mt} is the monthly value-weighted return on all NYSE, AMEX, and Nasdaq stocks. SMB_t (Small Minus Big) is the average monthly return on the three small portfolios minus the average return on the three big portfolios. HML_t (High Minus Low) is the average monthly return on the two value portfolios minus the average return on the two growth portfolios. UMD_t is the average return on the two high prior return portfolios minus the average return on the two low prior return portfolios. INV_t is the investment factor from Lyandres, Sun and Zhang (2008). a are the portfolio's monthly intercepts in percent, and b, s, h, m and i are its factor loadings. The numbers in parentheses are t-statistics. ***, ** or * signify that the t-statistic is significant at the 1, 5 or 10% level, respectively. The sample includes IPOs from the bubble period (1999 and 2000). Returns are taken between 2000 and 2002 (36 observations) to allow for there to be sufficient firms in each portfolio.

	a	b	s	h	m	i	Adj. R^2
Panel A: Equal-Weighted Portfolios							
Low IGROW	0.16	1.37***	1.08***	−0.17	−0.44***	0.62*	89.6%
	(0.20)	(7.77)	(6.99)	(−0.89)	(−4.21)	(1.93)	
Mid IGROW	−0.64	1.73***	1.13***	−0.69**	−0.48***	0.30	88.8%
	(−0.56)	(6.73)	(5.01)	(−2.47)	(−3.19)	(0.64)	
High IGROW	−0.76	1.29***	1.11***	−1.02**	−0.63***	0.04	81.8%
	(−0.49)	(3.73)	(3.67)	(−2.74)	(−3.11)	(0.06)	
High−Low IGROW	−0.92	−0.08	0.03	−0.85***	−0.20	−0.59	40.3%
	(−0.72)	(−0.29)	(0.12)	(−2.77)	(−1.17)	(−1.12)	
All IPOs	−0.41	1.46***	1.11***	−0.63**	−0.52***	0.32	88.9%
	(−0.40)	(6.31)	(5.44)	(−2.50)	(−3.77)	(0.75)	
Panel B: Value-Weighted Portfolios							
Low IGROW	−0.31	1.38***	0.69***	−0.05	0.16**	−0.03	93.4%
	(−0.63)	(12.48)	(7.07)	(−0.43)	(2.47)	(−0.16)	
Mid IGROW	−1.15	1.73***	0.98***	−0.89***	0.11	−0.88	87.4%
	(−0.89)	(6.01)	(3.88)	(−2.86)	(0.64)	(−1.67)	
High IGROW	−1.49	2.23***	0.71***	−1.01***	0.25	−0.96*	89.3%
	(−1.15)	(7.72)	(2.80)	(−3.24)	(1.46)	(−1.80)	
High−Low IGROW	−1.18	0.85***	0.02	−0.96***	0.09	−0.92	67.1%
	(−0.87)	(2.81)	(0.09)	(−2.93)	(0.49)	(−1.66)	
All IPOs	−1.36*	1.67***	0.77***	−0.61***	0.26**	−0.26	92.5%
	(−1.77)	(9.64)	(5.08)	(−3.24)	(2.51)	(−0.81)	