The Long-Run Role of the Media: Evidence from Initial Public Offerings*

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The unique characteristics of the U.S. initial public offer (IPO) process, particularly the strict quiet period regulations, allow us to explore the effects of media coverage when the coverage does not contain genuine news (hard information that was previously unknown). We show that a simple, objective measure of pre-IPO media coverage is positively related to the stock's long term value, liquidity, analyst coverage, and institutional investor ownership. We do not find a relationship between pre-IPO media coverage and long term underperformance. In all, adding to the short term role of attention documented in Da, Engelberg and Gao (2011), we find a long term role for media coverage, consistent with Merton's (1987) investor recognition hypothesis.

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1. Introduction

Traditional asset-pricing theory would argue that media coverage should not affect asset prices unless it provides genuine news in the sense of new hard information that had not previously been available. Yet some recent studies[1] seem to suggest that media coverage may be significantly related to asset prices even when it does not reveal hard, breaking news. The question of the nature of media coverage is difficult to determine, however, in part because it is hard to find settings which offer clean distinctions between hard and soft information revelation.

Initial public offerings (IPOs) offer a unique and useful setting in which to isolate this issue. Firms that have filed for a U.S. IPO are relatively uniform in the sense that they are all undergoing a major, potentially newsworthy event and are all attempting to attract the attention of the market, subject to U.S. quiet period restrictions. An IPO is typically the time in a company's life when the most hard information is revealed, all at once and in one standardized, publicly available form – through the Prospectus. U.S. regulations are designed to level the playing field in terms of information about the offering, and thus issuers face substantial penalties if they reveal hard information in any way other than through putting it in the Prospectus, where all investors have easy access to it (particularly since 1996, when all filings with the SEC by U.S. companies have been posted online through the Edgar website).[2] Thus, when a company is in its filing period

[1] For example Tetlock (2007), Tetlock, Saar-Tsechansky and Macskassy (2008), Fang and Peress (2009) and Tetlock (2011).

[2] Such quiet period restrictions on non-Prospectus communications are relatively unique to U.S. IPOs – we do not know of similar restrictions for any other country. It should also be noted that the U.S. restrictions are much stricter, and more strictly enforced, for IPOs than for seasoned equity or debt registrations. For example, the Paypal IPO ran into trouble because a Paypal executive answered an

for an IPO, media coverage is unlikely to contain any "genuine news" in the sense of new, factual information.

In a contemporary study, Da, Engelberg and Gao (2011) measure the effect of attention on IPOs through a unique indicator of self-directed investor research – Google searches of firms during their IPO filing periods. They find that high levels of such searches are related both to higher initial returns and to more long term underperformance. In other words, they find a short term role for attention, which is later reversed. As the authors point out, Google searches are more likely to reflect retail rather than institutional investor attention. In this paper, we use media coverage as our measure of attention, thus possibly measuring a different type of attention from a different group of investors, and our focus is mainly on determining whether there is a long term role for investor attention in IPOs.

Long term effects are more likely to arise from the type of attention (aka investor recognition) modeled by Merton (1987). If investors only consider stocks with which they have a certain level of familiarity, then having more investors paying attention to the stock effectively shifts out the demand curve.[3] Media coverage may cause this shift in the demand curve, or it may simply reflect the shift. The key distinction is that the effect will be lasting rather than temporary. Fang and Peress (2009) find evidence of the Merton investor attention hypothesis, in that stocks that do not receive media attention pay a higher return than stocks that receive substantial coverage. Their analysis is of a

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investor's question by referring that investor to a specific page in the Prospectus – because a specific page number was given, the SEC required a risk factor to be added to the Prospectus warning that the entire offering might be undone up to a year after it had been completed, based on their final ruling regarding this possible quiet period violation. Moreover, in 2004 the SEC forced both Google and Salesforce.com to postpone their IPOs because of potential quiet period violations. In the case of Google, the infamous Playboy interview had to be included in the Prospectus.

[3] Gao and Ritter (2009) explore ways that issuers can shift out their demand curve in a seasoned equity offering, finding evidence for a large, transitory shift from fully marketed offerings.

broad cross-section of already-public companies. We attempt to take advantage of a more controlled setting to look not just at current, short term effects but at a possible long term role for media coverage, by measuring whether pre-IPO coverage is related to long term liquidity and firm value.

In this paper, we use a straight-forward, objective count to measure the amount of pre-IPO media attention each company receives, for U.S. IPOs from 1980 through 2004. To obtain our media coverage variable, we search the Factiva database by IPO company name from the filing date to the issue date, counting the number of articles in major business media sources that refer to the company. We find that analyst coverage, the number of institutional investors, liquidity and firm value are all related to our measure of pre-IPO media coverage in the three years following the IPO. We do not find a relationship between pre-IPO media coverage and long term return performance.

Although pre-IPO media coverage in the U.S. is unlikely to contain any "genuine news" in the sense of new, factual information, the coverage might reveal soft information, or it might simply be repetition of stale news, repeating what is already in the Prospectus. The repetition of stale news may affect asset prices due to the "truth effect," where people are more willing to believe something that they have heard or read repeatedly. Tetlock (2011) finds evidence that individual investors react to stale information, leading to temporary stock price movements that are later at least partially reversed.

Media coverage may also be related to other temporary distortions of the stock's initial aftermarket value. In particular, media coverage may induce sentiment on the part of investors, i.e., beliefs about asset values that are unwarranted by fundamentals.

Behavioral biases have been documented for retail IPO investors.[4] This naturally raises the question of whether media coverage drives sentiment investor trading in IPOs. Given the motivations of journalists (which are discussed in more detail in Section 4.1), media coverage should tend to reflect fundamental demand, based on the professional opinions of those journalists and their sources, but it may also reflect sentiment investor demand, and it might even create such demand. We thus look for a reversal, i.e. for long term underperformance related to pre-IPO media coverage, as well as for sustained, long term effects. However, we do not find evidence that pre-IPO media coverage is related to stocks' long term performance.[5]

This paper contributes to the rapidly expanding area of research on the roles of attention, marketing and media coverage.[6] Tetlock, Saar-Tsechansky and Macskassy (2008) find that, for specific stocks, media coverage may capture otherwise hard to quantify measures of a firm's fundamentals, and that this additional information is quickly incorporated into stock prices (see also Schmitz (2007) and Tetlock (2010)). Grullon, Kanatas and Weston (2004) examine advertising expenditures, finding evidence that investors' familiarity with a firm affects its value and cost of financing. Bodnaruk

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[4] See, for example, Dorn (2009), Chiang, Qian and Sherman (2010) and Chiang, Hirshleifer, Qian and Sherman (2010). On the other hand, in a non-IPO setting, Kelley and Tetlock (2010) find evidence that many retail trades are informed. It is possible that some retail traders are rational and informed, while others are sentiment investors. Regarding media coverage and sentiment, Tetlock (2007) looks at the response to a popular *Wall Street Journal* column, finding that stock price reactions are consistent with the presence of noise and liquidity traders.

[5] This failure may, of course, be due to insufficient data. Nevertheless, our results combined with those of Da, Engelberg and Gao (2011) suggest that sentiment investor trading in IPOs is more likely to be self-directed rather than driven by media coverage. Similar to Field and Lowry (2009), we offer evidence that retail investors may benefit from better interpretation of readily available public information.

[6] Two of the earliest papers on this subject are Berry and Howe (1994) and Mitchell and Mulherin (1994), both of which find a relationship between public information and trading volume. Bhattacharya, Galpin, Ray and Yu (2007) examine aftermarket trading prices for IPOs during the internet bubble, concluding that media coverage cannot explain the difference in risk-adjusted aftermarket returns for internet and non-internet IPOs during this period. Demers and Lewellen (2003) also examine the marketing of internet stocks.

and Ostberg (2009) also find evidence of the Merton attention effect using Swedish data that allows them to observe investors' entire portfolios. Our contribution is to examine the long run role of media in a setting that allows a relatively clean separation between soft and hard information.

Related to the media literature is the work on analyst coverage. Just as Fang and Peress find that firms with less media coverage have higher required rates of return, Kelly and Ljungqvist (2007) find that firms that experience an exogenous reduction in analyst coverage have higher required rates of return, as well as less efficient pricing and lower liquidity. This and other work on analyst coverage indicates that there is value to maintaining the attention of investors, as modeled by Merton.[7] We contribute to this literature by showing that firms with high media coverage before their IPO have significantly higher expected analyst coverage up to three years after their IPO, as well as more institutional investors, more liquidity and a higher value based on fundamentals.

In short, using a simple, objective measure of media coverage, we show that pre-IPO media coverage is related to persistent, long term effects as predicted by the attention theory. The rest of the paper is organized as follows. Section 2 introduces the data set and the variables used in the sample. In Section 3, we test various implications of the attention theory for the role of media, while in Section 4 we discuss the motivations of journalists and explore what drives media coverage. Section 5 concludes.

[7] Such as Kecskes and Womack (2008), Khorana, Mola and Rau (2007) and Hong and Kacperczyk (2007).

2. The data

2.1 Sample

We begin with all IPOs completed between January 1980 and December 2004 in the U.S., as reported in Thomson Financial's Securities Data Company (SDC) database. We exclude unit offers, closed-end funds, real estate investment trusts (REITs), American Depositary Receipts (ADRs), limited partnerships and firms with offer prices below $5. We further require the firms to be in the Center for Research in Security Prices (CRSP) and Compustat datasets in the issue year.

The underwriter gross spread, share overhang, price revision percentage, offer size, etc. are from SDC. Pre-IPO assets is from SDC, or Compustat if the SDC data item is missing. Accounting data are from Compustat; stock return and turnover data are from CRSP. The Carter-Manaster rank of lead underwriter and internet and technology firm indicators are from Jay Ritter's website.

To determine the first day return, we use the first available closing price from CRSP if it is within 14 days of the offer date. When the CRSP closing price is not available, we use the stock price one day after the offer, or if necessary two days or one week after the offer, as reported in SDC. We divide all the dollar amount variables, such as total gross spread, assets and offer size, by the Consumer Price Index to control for inflation. The Consumer Price Index, which takes the value of 100% in year 1972, is obtained from the Federal Reserve Bank of St. Louis. All variables are winsorized at the 99^{th} and 1^{st} percentiles to mitigate the influence of outliners. Detailed variable definitions are given in the Appendix.

Table 1 reports summary statistics for the main variables used in the study. We have a total of 3,627 completed IPOs. The sample size is smaller than that in some other studies because we restrict the sample to the intersection of the SDC, CRSP and Compustat databases. The average underwriter gross spread is $1.1 million, with a mean offering size of $17.0 million. The IPO firms have a median age of 7.0 years and median assets of $8.5 million.[8] Technology firms and internet firms account for 38% of the sample, while global offers account for 16%. 44% of the IPOs are backed by venture capitalists. The average first day return is 19.2%. About 42% of the sample firms revise their offer prices upwards from the midpoint of the initial filing range and 43% revise their prices downwards, while around 15% end up pricing precisely at the midpoint of the initial range.[9] The average price revision is around 7.8% for an upward revision.

2.2 Construction of media coverage variable

We use Factiva to quantify the amount of media coverage, restricting the media sources to Dow Jones Newswire, Major News and Business Publications (U.S. and Canada), Press Release Wires (Business Wire, Business Wire Regulatory Disclosure, Canada Newswire and PR Newswire U.S.) and Reuters Newswires (Reuters News). We use the full company names as the search criteria but allow for common abbreviations such as "Co.", "Corp.", "Inc.", "Ltd." and "Grp.". For each IPO company, the search window is from one day after the filing date to one day before the offering date. We count the number of articles from these media sources that mention the IPO company

[8] The means and standard deviations for assets and age are thrown off by a few large values, since we do not winsorize variables for which our analysis uses the logarithms rather than the raw numbers.

[9] Lowry and Schwert (2004) question whether the filing range midpoint is an unbiased predictor of the final offer price, since revisions to the initial range are predictable based on publicly available information. However, they find that the economic significance of any bias is slight and that the pricing process is "almost efficient".

during the window. Since the length of the window varies across firms, we standardize the media coverage measure into a per month measure.

We do not attempt to categorize media articles as either "good" or "bad". Such categorizations are done in Bhattacharya, Galpin, Ray and Yu (2007) and Kaniel, Starks and Vasudevan (2007), which both use human classification approaches that would be too time-consuming for our sample size. Cook, Kieschnick and Van Ness (2006) perform such a classification of positive vs. negative coverage for a random subsample of 5,452 of their articles on IPOs, finding that "over 99% of these articles were non-negative, primarily descriptive stories". Given their results, it is unlikely that categorizing our stories would significantly affect our results.

Journalists exercise their judgment primarily by deciding which companies to cover. Their role, once they have chosen to report on a stock, is to report information and not to editorialize. Thus we feel that the primary information for our purposes is the mere fact that a reporter felt that the company was newsworthy, not whether the tone of the article was positive or negative. A somewhat similar argument is made in Das, Guo and Zhang (2006), who argue that an analyst's decision of whether or not to cover a stock may be a better indicator of the analyst's opinion of the stock than the analyst's specific recommendation or earnings forecast.

We also do not attempt to categorize whether the article is primarily about the IPO company or is instead about the industry or another stock, with only a brief mention of the IPO company at the end. Such categorizations are done in Chan (2003) and Fang and Peress (2009), both of which are examining secondary market trading rather than IPOs. Barber and Odean (2008), on the other hand, use a simple count similar to ours.

Vega (2006) uses a count of the number of days a particular firm is mentioned in at least one news story.

Although there are many benefits to a more detailed weighting of the primary focus of each article, we feel that a simple count is more relevant for our specific purposes, in examining IPOs. If brief announcements of all upcoming IPOs were routine, then such mentions would not lead to variations between the firms in our sample and thus would not affect our results. However, in practice only some stocks receive even those brief mentions at the ends of articles about other companies, suggesting that even brief mentions are selected by journalists, who have an incentive to focus on the more newsworthy offerings.[10] By simply counting every mention of a company's name without judging either whether the article is positive or negative, or whether it is mainly about that particular company, we are able to construct a simple, objective measure which, in the end, leads to robust results that are both statistically and economically significant.

The first row of Table 1 reports summary statistics for the media coverage (MEDIA) variable, our count of the number of articles mentioning the company per month during the IPO filing period. The media variable has some extreme values, with a maximum value of 163.9 while the 90th percentile is only 6.67. In all of our analyses, we winsorize MEDIA at the 99th percentile. After winsorizing, the mean of MEDIA is 2.69,

[10] Note that, because these firms are in their IPO quiet period, our count will not include routine press releases put out by the company itself, as might be true in a media count for already–trading public companies.

with a median of 1.45 and standard deviation of 3.52. About 17% of the observations received no media coverage.[11]

3. Analysis

We will focus our analysis on tests that help us to determine whether pre-IPO media coverage plays a lasting role, for example through long run investor attention as in Merton (1987). The Merton attention model is based on an additional information cost that has frequently been overlooked in asset pricing – the cost of making investors aware of the firm. In Merton's model, investors make rational decisions within their choice set, but their choice set includes only companies of which they are aware, i.e. companies that have caught their attention. Companies that have the attention of many investors thus have a higher value and lower cost of capital – their demand curve is permanently shifted upwards. Thus our tests largely focus on whether pre-IPO media coverage is related to the long term value of the stock and to measures of investor attention.

3.1 The persistence of attention

To measure post-IPO attention, we first examine the following three proxies: number of analysts who cover the stock, number of institutional investors who hold the stock and aftermarket liquidity. A survey conducted by Bushee and Miller (2007) shows that investor relations professionals believe that attracting buy-side (institutional) investors, attracting analysts and increasing media awareness are important ways to increase a firm's visibility. Both analyst coverage and institutional holdings are widely

[11] Fang and Peress (2009), focusing on stories of major relevance for the company in one of four main newspapers, also find that coverage is skewed, with more than one-fourth of NYSE stocks and one-half of NASDAQ stocks not receiving media coverage in a typical year.

used in the literature as proxies for attention or investor recognition. (e.g. Brennan, Jagadeesh and Swaminathan (1993), Grullon, Kanatas and Weston (2004), Hou and Moskowitz (2005)).

To the extent that media coverage during the IPO filing period proxies for attention, and that attention persists, we expect IPO firms with more media coverage to have more analysts following and more institutional investors holding the stocks for several years post IPO. Similarly, if pre-IPO media coverage attracts a higher level of investor attention, then any liquidity effects should be persistent.

Our analyst coverage data is from Institutional Brokers Estimate System (IBES). Analyst coverage is defined as the number of analysts providing earnings forecasts for a given year following the IPO issue date. The analyst variable starts at 1994, to allow for reasonable IBES coverage. The number of institutional investors is taken from Compact Disclosure. It measures the number of institutions which hold the stocks at the end of the relevant fiscal year. We require the first fiscal year end to be at least two months post IPO. Our results are robust if we do not skip the first month. We prefer to report the results which skip one month in defining the first fiscal year end because the financial statement right after the IPO mainly reflects the IPO effect, while our tests focus on the long run effect.

We measure liquidity using the logarithm of turnover ratio. Using CRSP monthly data, turnover ratio is constructed as the monthly trading volume divided by total share outstanding, averaged over event year. Following Gao and Ritter (2010), we adjust the trading volume of Nasdaq to make it comparable with those reported in NYSE and AMEX. In particular, we divide Nasdaq volume by 2 for months prior to February 2010;

for February 2001 to December 2001, we divide Nasdaq volume by 1.8; for 2002 and 2003, we divide it by 1.6. No adjustment is made after 2003.

We begin our analysis with univariate tests. We first sort IPO firms into four groups according to their pre-IPO media coverage. All firms with zero media coverage are classified as zero media. Firms with positive media coverage are split into three portfolios with an equal number of firms in each, which we denote: low media, medium media and high media. For each of the subsequent five years post-IPO, we construct rank variables for each IPO company based on two key measures: analyst coverage and number of institutional investors. Results are shown in Figure 1. Panels A and C of Figure 1 use raw numbers of analysts and institutions, while Panels B and D use the relative ranks of the IPO firms. The ranks are relative to all IPOs issued within a 360-day window centered around the issue date of the IPO of interest, and then standardized to have an upper (lower) bound of 0.5 (-0.5).

Several features of the graphs are worth discussing. First, there exists large cross-sectional dispersion in media coverage. Untabulated results indicate that the average values of media coverage are 0.7, 2 and 7 media articles per month for the low media, medium media and high media IPOs, respectively. Second, consistent with more media coverage firms also receiving more attention post-IPO, analyst coverage and the number of institutional investors increase monotonically from the zero media IPO companies to the high media IPO companies. Third and most important, the attention measures are highly persistent. Even at the fifth year post IPO, zero media firms have the lowest numbers of analysts and institutional investors, while high media firms have the highest numbers.

Our univariate results are consistent with those reported in Fang and Peress (2009). They show that a significant fraction of stocks with no media coverage in a given month continue to have no media coverage in the next month, while about half of the stocks with high coverage continue to have high coverage the next month. While they show a monthly positive autocorrelation of media measure, our tests focus on longer horizons. Our results show that attention, as proxied for by media, persists years into the future.

Next, we extend the univariate analysis by implementing regression tests that control for the impact of other variables that may also affect analyst coverage, liquidity and institutional following. In Table 2, we regress the number of analysts following (N_ANALYST) on pre-IPO media coverage (MEDIA) at years 1, 2 and 3 following the IPO, after controlling for other variables.

Our control variables include the post-IPO size of the company (log(SIZE)), the rank of the underwriter (RANK), the age of the company (log(1+AGE)), whether the firm was backed by venture capitalists before the IPO (VC), the price revision (ΔP), the initial return to the stock in the IPO (IPORETURN), and dummies for whether the IPO firm will be listed on NASDAQ or AMEX. We also consider the average monthly return to the stock (RETURN), measured over a given fiscal year. Finally, we add the inverse of the most recent year-end stock price (1/PRICE), and earnings divided by the book value of asserts (ROA) measured at a given fiscal year end. These control variables are inspired by Grullon, Kanatas and Weston (2004). Year dummies are also included, and standard errors are adjusted for clustering by industry, where industry is measured through four digit SIC codes.

We use essentially the same set of control variables for all regressions in this section for the sake of consistency. For robustness, however, in unreported tests we have also calculated our analyst regressions using a set of choice variables inspired by Aggarwal, Krigman and Womack (2002). Results are consistent.

Aggarwal, Krigman and Womack also point out that there is a potential selection bias when analyst data providers decide which firms' information to provide. As a further robustness check, we follow their methodology and address the selection issue by estimating a Heckman two-stage model (see Aggarwal, Krigman and Womack, 2002, pages 125-126). The first stage is a probit model where the dependent variable is an indicator variable standing for the firm's coverage by IBES and the explanatory variables are firm size, venture capital backing, underwriter ranking, industry, recent stock returns, recent trading volume, and time dummies.

Lambda, which is the inverse Mills ratio estimated from the first stage regression, is included in the second stage regression to adjust for the selection bias. The first stage regression is omitted to save space. We add number of all managing underwriters for the IPO (N_M) as an additional control variable, again motivated by Aggarwal, Krigman and Womack.

The key result from Table 2 is that media remains significantly related to the number of analysts covering the stock in each of three years post IPO. As for control variables, pre-IPO size, the IPO return and the number of managing underwriters are significant over all three years.

In unreported results (available on request), we also explore analyst forecast optimism, as measured by the difference between earnings forecasts and realized earnings,

to see if the additional analyst coverage is a sign either of sentiment on the part of analysts or of successful promotion of the stock, independent of the underlying quality. There is no significant relationship between pre-IPO media coverage and later analyst forecast optimism, which implies that the higher level of analyst coverage after the IPO is due to investor attention.

In Table 3, we explore the relationship between pre-IPO media and the number of institutional investors in years 1, 2 and 3 after the IPO, using the same basic set of control variables as in Table 2. Media coverage is positive and significant for all three years, consistent with Merton's attention model where companies that attract more attention at the time of the IPO continue to receive more attention from institutional investors over time.

Next we examine the relationship between pre-IPO media coverage and subsequent liquidity. In Table 4, we measure liquidity through turnover – the natural logarithm of average monthly shares traded as a percentage of total shares outstanding, measured over the first, second and third years post-IPO. The control variables are the same as in Tables 2 and 3. Media coverage is positive and significant for all three years. In unreported analysis, we also use relative bid ask spread percentage and relative price impact percentage as measures of liquidity, and results are generally consistent. Thus, the results for all of our proxies for investor attention are consistent with pre-IPO media coverage being related to attention.

3.2 Long term value

In this section, we explore the relationship between pre-IPO media coverage and the long term value of the stock. According to Merton's attention theory, companies that

receive a higher level of attention from investors will have a higher value, for a given level of performance, not only at the time of the IPO but also in the long run. If media is related to attention, those companies that attract more pre-IPO media coverage will have their demand curve shifted upwards permanently and therefore have higher long term values.

We measure long term value following the approach used by Kim and Ritter (1999) and Purnanandam and Swaminathan (2004), looking at two ratios – price to sales (PS) and price to earnings before interest and taxes (EBIT) – to measure the value of the firm over the first three years after the IPO. We also divide the ratios by the median ratios of firms in the same industry at the same fiscal year end. Using industry median ratio as a benchmark of the firm value, the second measure controls for the cross-industry variation of firm value. Our industry classification is as defined in Fama and French (1997). Finally, we take the natural logarithm of both measures. Sales, EBIT and firm market value are measured at the first, second and third fiscal year end post IPO.

Cook, Kieschnick and Van Ness (2006) also use one of these two measures to explore IPO valuation in the offer itself, showing that offers with more media attention tend to have higher price to sales ratios than the ratios for their industries, based on their offer prices. They argue that this relationship indicates that media coverage leads to temporary demand and to an inappropriately high offer price relative to fundamental value, consistent with sentiment investor models. However, the Merton attention explanation of media coverage can also explain a positive relationship between media coverage and the offer price. The difference between the two interpretations of media coverage is in whether the effect of media coverage is temporary or long term, and thus

we explore the long term value of the company by looking at valuation up to three years after the IPO.

The results are reported in Table 5, with price to sales ratios as the dependent variables in Panel A and price-to-EBIT ratios in Panel B. We explore the relationship between these long term valuation ratios and pre-IPO media coverage (MEDIA) after controlling for ROA, log(ASSETS), RANK, log(1+AGE), VC, ΔP, IPORETURN and dummies for NASDAQ and AMEX. We also add year dummies to the regressions, and adjust standard errors for clustering by industry as measured by four digit SIC codes.

MEDIA is positively related to future valuation ratios for both ratios, measured either as raw ratios or as comparisons to industry median ratios, over all three years, at the 1% level. These results support the argument that media, as a proxy for investors' attention, reflects a permanent upward shift of the demand curve and thus is related to a firm's long term value.

3.3 Long run returns

In this section, we explore the relationship between pre-IPO media coverage and the firm's long run return performance. If media coverage creates or reflects investor sentiment, then the initial aftermarket trading price of firms with high media coverage will tend to be strictly greater than the firm's long run fundamental value, because the initial trading price is affected by sentiment investors' irrational preferences. The overall long term underperformance of IPO firms, first established by Ritter (1991), is supporting evidence for this story – if the first day closing price is higher than the fundamental value because of short run sentiment demand, the price will revert back to the true value over the long run, causing long run under-performance. Moreover, Da, Engelberg and Gao

(2011) find evidence that long term underperformance is related to the number of Google searches of the issuer's name during the filing period before the IPO. Thus, it seems well established that sentiment investors play a role in determining IPO aftermarket prices for at least some offerings.

The positive relationship between pre-IPO media coverage and IPO initial returns is documented by Cook, Kieschnick and Van Ness (2006), who interpret media as a measure of investor sentiment and interpret their findings as evidence that media coverage induces short term sentiment demand for the stock. We argue that the relationship between media coverage and initial returns is also consistent with a permanent shift up in the demand curve, for example due to increased investor attention as in Merton (1987).[12] As Tetlock (2007) points out, "The sentiment theory predicts short-horizon returns will be reversed in the long run, whereas the information theory predicts they will persist indefinitely." Thus in this section we examine the relationship between pre-IPO media coverage and long term return performance.

We measure the long run abnormal return of an IPO firm as the difference between the buy and hold return of an IPO firm and the return of a size and book-to-market matched benchmark portfolio. The return data are from the CRSP daily return file. We calculate the buy and hold return for each IPO firm for the first, second and third full years after the IPO. For the first year return, we begin from the second day that the shares trade. We further construct 25 size and book-to-market portfolios as benchmark. At the beginning of each year, we group all the available non-issue firms that are traded on NYSE, AMEX or Nasdaq into 5 size portfolios and 5 book-to-market

[12] Theoretical models that relate Merton's investor attention to IPO pricing include Sherman and Titman (2002) and Zhang (2004). Kecskes (2009) explores the effects of attention on IPOs empirically.

portfolios independently. We hold the 25 equally-weighted size and book-to-market portfolios for one year and re-form the portfolios each year. At the beginning of each year, we match each IPO firm with one size and book-to-market portfolio. The matching is repeated each year.

Only NYSE firms are used in setting size breaking points. Non-issue firms are defined as firms that have been available on CRSP for at least five years. Therefore, the first five years of observations after a firm first shows up on CRSP are excluded from the benchmark sample. Size, also known as market value of equity, is measured as the beginning of the year price multiplied by shares outstanding, and book-to-market is the most recent available book value of equity divided by beginning year market value of equity.[13] For IPO firms, the first year market value of equity used to do the size match is measured as the first available value of market capital. We calculate the first year book-to-market ratio of IPO firms used for matching as per-share book value of equity after issuance (from SDC) divided by the first after-market closing price. If the book value of equity from SDC is unavailable, we use the first year end book-to-market value as the value for the first year.[14]

Table 6 reports the results of the long run abnormal returns regressed on pre-IPO media coverage. In the first regression, we use media coverage as the sole explanatory variable. We add several control variables in the second regression. Previous studies show that IPO long-run under-performance is positively related to underwriter's

[13] We use COMPUSTAT data for shares outstanding because CRSP only reports traded shares when a firm has dual-class shares. Our results are robust if we use CRSP data.

[14] Several studies (Kothari and Warner, 2005, among others) show that measures of long run abnormal returns suffer from certain statistical issues. However, as long as the biases of the long run return measures do not vary in a systematic way with our measure of pre-IPO media coverage, our cross-sectional tests should not suffer from the above-mentioned statistical problems.

reputation (Carter, Dark and Singh, 1998) and whether the issue is backed by venture capitalists (Chan, Cooney, Kim and Singh, 2008). We therefore control for lead underwriter rank and have a dummy for venture backed issues. We also control for total assets, firm age, price revision, return on assets and IPO initial return, and have dummies for listing on NASDAQ or AMEX. The standard errors are adjusted for clustering by industry, where industry is measured by four digit SIC codes. We do not incorporate year dummies in the regressions reported in Table 6 – adding these dummies does not change the results. MEDIA is not significant in either of the regressions for any of the three years.

Thus we fail to find supporting evidence for the short run sentiment demand interpretation for the role of media. This may of course simply show that our dataset is not large enough or our tests powerful enough to discern this short term, temporary role for pre-IPO media coverage. It is worth repeating that we do not argue against either the existence of investor sentiment or its effect on IPO prices. Our goal in this paper is to explain the role of the media, and although sentiment has been shown to exist, we do not find evidence that it is related to pre-IPO media coverage.

4. Media Coverage

Last, we explore what drives media coverage. Section 4.1 discusses the incentives of journalists, particularly of journalists that cover IPOs, while section 4.2 reports the results of regressions with media as the dependent variable.

4.1 The motivations of journalists

In any consideration of the effects of journalism and of why some companies receive media coverage while others do not, a key step is to examine the incentives of the journalists themselves. Media sources compete to attract readers, which allows them to attract advertising revenues. Their goal is not to be "fair" by covering all companies equally, regardless of demand from their readership. Editors expect their reporters to cover the companies that either have attracted or will attract the attention of the market. The better journalists are at predicting which stocks will attract attention, the happier their editors will be. Thus, although media coverage of IPOs does not contain new hard information, the very fact that a stock receives coverage indicates that journalists and/or their sources expect the stock to attract attention. This expectation on the part of "the market" may be a relevant form of soft information, according to Merton's theory.

Journalists use their own judgment in these forecasts, but they also talk to others on Wall Street. According to John Fitzgibbon, founder of the IPO investment newsletter the IPO SCOOP, there are "no secrets on Wall Street", because "Wall Street is just one big gossip".[15] Mr. Fitzgibbon rates IPOs before they begin to trade, first getting the opinions of many different people in the securities industry including investors that may have attended the road show as well as other investors, traders, analysts, rating services, etc.

In addition to Mr. Fitzgibbon, other independent IPO analysts (not affiliated with underwriters) include Francis Gaskins, Ben Holmes, and Scott Sweet. Lynn Cowan, who writes the *Wall Street Journal* IPO Outlook column, reviews every S-1 filing and forms

[15] Telephone interview with one of the authors, Sept. 27, 2007.

her own opinion, but then she checks the opinions of all four of these independent IPO analysts, to see if they agree. Roughly 80% of the time (by her estimate), there is general agreement between these four analysts and herself.[16] When there is not, she tries to find out why. Ms. Cowan also talks to many other sources. She then gives the most coverage to IPOs that she or others expect to be the most newsworthy.

Thus, the professional interests of journalists would seem to indicate that media coverage will be more than mere noise.[17] Coverage may include some stocks purely because of short term demand from retail investors who might be driven by sentiment, but it will also include stocks that sophisticated investors care about, or that journalists expect to do well in the future. Thus, pre-IPO media coverage may be related to the long term value of the company and, given the fixed costs of evaluating and interpreting ongoing information about the firm, companies that attract a high level of attention initially are more likely to continue to receive substantial attention in the future.

4.2 Media regressions

In Table 7, we empirically investigate what appears to drive pre-IPO media coverage. Panel A of Table 7 reports OLS regression results with MEDIA as the dependent variable. Given that the media coverage variable is non-negative, Tobit regression results are also reported.

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[16] Telephone interview with one of the authors, August 3, 2007.

[17] Cook, Kieschnick and Van Ness (2006) argue that variations in media coverage may be driven by the marketing efforts of investment banks, perhaps because some issuers pay higher fees in exchange for more promotion. However, the idea that variations in media coverage are due to variations in the underwriters' desire to promote each offering does not seem to match the incentives of the agents involved: not journalists, who want to please their editors by covering stocks that are newsworthy; not the issuers themselves, who want to attract attention whether or not they also choose to pay higher fees; and not the investment bankers, who want every offering to succeed so that they can build their reputation and get the chance to manage more IPOs in the future (particularly given that fees are high for all U.S. IPOs). Moreover, direct marketing to journalists by underwriters, outside the Prospectus, would violate the very strict quiet period regulations for U.S. IPOs.

Journalists that we have talked to say that key determinants of coverage include the size of the offering (more than $1 billion in expected proceeds) and whether the industry is 'hot'. We thus incorporate as explanatory variables the logarithm of the offering size (log(OFFSIZE)) and an indicator variable representing whether the offering is a technology or internet stock (TECHINT).

Other independent variables include the rank of the lead underwriter (RANK), the size and age of the company (log(SIZE) and log(1+AGE)), a venture capital backed indicator (VC), a global issue indicator (GLOBAL), the logarithm of total dollar amount of underwriter fees adjusted for inflation (log(GROSS_SPREAD)) and retained shares as a proportion of the total share offering (OVERHANG). Finally, we add year dummies in the regressions to control for the potential time trend in the media measure. All standard errors are adjusted for clustering by issuing month.

In the second regression, we add several more explanatory variables. We add market returns (MARKETRET) based on the value-weighted market return on all CRSP stocks for the last 15 days prior to the IPO day (in order to be consistent with earlier research such as Lowry and Schwert (2002)). We also explore whether overall market sentiment drives media coverage by including two sentiment measures: University of Michigan Consumer Sentiment Index (SENTI_MICH) and sentiment index constructed in Baker and Wurgler (2006) (SENTI_BW). The Michigan Sentiment Index is obtained from the Federal Reserve Bank at St. Louis and Baker and Wurgler's Sentiment Index is available from Jeffrey Wurgler's website.[18] Both sentiment indexes are positively related to market euphoria.

[18] See, http://pages.sterm.nyu.edu/~jwurgler/.

Last, we include several measures related to price revision, beginning with the percentage price revision (ΔP) from the midpoint of the initial range to the final offer price. This should be interpreted with caution because the actual final offer price is set after media coverage is fully observable, at the very end of the IPO process. However, although the final offer price is set only at the very end, the offerings that end up being priced farthest from the mid-point of the initial range are likely to have filed revised price ranges during the process.[19] Thus, there is some interaction between price revisions and media coverage. Related to this, we also include a dummy variable that is equal to one when the price revision is positive and zero otherwise (ΔP_D), and the interaction of this term with price revision (ΔP^{+}), which is equal to ΔP when the price revision is positive and zero otherwise.

For all regressions, we find that technology/internet companies, VC-backed companies, global offerings and offerings with greater management retained shares are related to more media coverage. Overall market sentiment as measured by the Michigan Sentiment Index is positively related to media coverage. Price revisions are also related to media coverage, with firms that experience greater price revision in either direction (positive or negative) tending to attract a greater amount of MEDIA. Positive price revisions attract even more media attention than negative revisions.

Offering size is related to media coverage in only one of the regressions, at the 5% level. This is somewhat surprising, given that journalists mentioned this as a key

[19] U.S. securities law requires issuers to give a "bona fide" estimate of the offering price before they can begin marketing an offering. To enforce this, the SEC does not allow the initial range to be too wide (there is a safe harbor of no more than $2 or 10%, although this was increased to $2 or 20% in response to the uncertainty after the Sept. 11, 2001 terrorist attack). Issuers can price up to 20% outside the range without re-filing, but must file a revised price range to go outside those limits. Re-filing costs little but can delay an offering if done at the very end. Thus, if feedback from the road show is substantially better or worse than expected, revised ranges are usually filed during the process, to avoid the delay of a re-filing at the end of the process.

factor. However, what journalists tended to mention were offerings of more than $1 billion in proceeds (i.e., high profile offerings such as Visa, Mastercard, UPS or Google), and such large offerings are relatively rare. We also find some weak support for a positive relationship between media coverage and underwriter fees, consistent with Cook, Kieschnick and Van Ness (2006). This may be related to the result on offering size, since larger offerings tend to pay larger gross spreads (although they also tend to pay lower percentage spreads). And, we find some mixed evidence that offerings listed on NASDAQ or AMEX get more media coverage.

We further explore the determinants of media coverage in Panel B of Table 7 by doing the same regressions for excess or abnormal media coverage (ABMEDIA), which is the difference in monthly average media mentions between the filing period (our original measure) and a control period extending from 12 months to 6 months before the IPO filing month. As is shown in Table 1, MEDIA averages 2.7 mentions per month during the filing period, with a median of 1.5, while ABMEDIA averages 2.1 mentions per month, with a median of 1.2. Thus the IPO filing period is a time when many firms appear to first attract attention, or to attract additional attention, based on this measure.

The regression results for abnormal media in Panel B of Table 7 are very similar to those for media in Panel A. The key difference is that VC-backed firms and technology/internet firms do not see quite as strong an increase in abnormal media coverage, perhaps because such companies were more likely to receive media attention even well before their filing period. In unreported results available upon request, we ran all of our earlier regressions for abnormal media rather than media, and results are consistent.

5. Conclusion

In this study, we document that media coverage before an IPO significantly relates to long term measures of investor attention and firm value. Our measure of media coverage is a simple count (based on a Factiva search, with duplicates excluded) of the number of times that the company's name is mentioned in major news and business publications during the filing period. This objective, quantifiable measure can be replicated both for other countries and for other time periods.

IPOs are a good setting in which to examine the long run role of media coverage because they involve a relatively uniform beginning sample. These firms are all attempting to attract attention, are all undergoing a major event that makes them potentially eligible for attention, and yet are all restricted (due to strict U.S. quiet period regulations for IPOs) in such a way that media coverage is extremely unlikely to contain new hard information not already revealed in the Prospectus.

While other studies (Da, Engelberg and Gao (2011) for IPOs and Fang and Peress (2009) for a cross section of already-public companies) have offered evidence of short term attention effects, we provide evidence of a long term role for pre-IPO media coverage. Merton (1987) argues that, once investors become familiar with a company, they will continue to follow it and will consider investing in it even when they would not consider investing in other similar companies with which they are not familiar. Thus, we would expect attention to be persistent. If the role of the media is related to investor attention as in Merton, we would expect pre-IPO media coverage to be positively related to analyst coverage, liquidity and institutional investor ownership in the years after the

IPO, and to the long term value of the company as measured by price/sales and price/EBIT ratios. Our results are consistent with all of these predictions.

These results contribute to the growing literature on the media in asset pricing. In particular, our results are consistent with Tetlock, Saar-Tsechansky and Macskassy (2008), who find that media coverage captures hard-to-quantify soft information about a firm's fundamental value, which is then incorporated into stock prices. Our paper also contributes to the literature on analyst coverage. We show that media coverage before the IPO, as well as the IPO price revision and initial return, are related to analyst coverage one, two and three years after the company has begun trading, as well as to liquidity and the number of institutional investors holding shares in the company during those first three years. Our results are consistent with work such as Fang and Peress (2009), who find support for the Merton attention model by showing that companies that do not attract media attention on the aftermarket have a higher cost of capital, as well as Kelly and Ljungqvist (2007), who find that firms that experience an exogenous reduction in analyst coverage have a higher cost of capital.

Our results complement those in Da, Engelberg and Gao (2011), who find that Google searches before an IPO are positively related to IPO initial returns and negatively related to long run returns. Da et al. thus find that sentiment investors perform their own self-directed research on IPOs. Our results suggest that such investors would perhaps be better off following the professional opinions of journalists and their sources, as reflected by media coverage.

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Appendix. Variable Definitions

Variable Name	*Definition*
MEDIA	The number of media articles covering the IPO firm from one day after the filing date to one day before the offer date, standardized into a per month rate
ABMEDIA	The difference of MEDIA and monthly average media coverage measured from month t-12 till month t-6 where month t is the IPO filing month
N_ANALYST	Number of analysts following the stock of the firm, measured at the end the first, second and third year post IPO
N_INST	Number of institutional investors holding the stock of the firm, measured at the end the first, second and third year post IPO
log(TURNOVER)	Natural logarithm of average monthly share traded as a percentage of total shares outstanding, measured over the first, second and third year post IPO
log(SIZE)	The natural logarithm of post-IPO market value, measured as post IPO shares outstanding multiplied by offering price, adjusted for inflation by dividing the raw value by consumer price index, which is obtained from the Federal Reserve Bank of St. Louis and takes value of 100% at year 1972. Post IPO shares outstanding are taken from Jay Ritter's website for dual share offering and from CRSP for other offerings, or from SDC if CRSP data is not available
RANK	Carter-Manaster rank of lead underwriter, obtained from Jay Ritter's website
log(1+AGE)	The natural logarithm of 1 plus age of issuer at IPO in years, obtained from Jay Ritter's website
VC	Equal to 1 if the firm is venture capitalist-backed, and 0 otherwise
NASDAQ	Equal to 1 if the IPO firm will be listed on the Nasdaq, and zero otherwise
AMEX	Equal to 1 if the IPO firm will be listed on the American Stock Exchange, and zero otherwise
$\triangle$P	Percentage price revision, (offer price – midpoint of initial filing range)/midpoint of initial filing range
IPORETURN	The percentage change between IPO offer price and the first closing price from secondary market trading (i.e. the initial return)
ROA	Earning divided by book value of asset, measured at the end of the first, second and third fiscal year post IPO
1/(PRICE)	Inverse of stock price, adjusted for inflation, measured at the end of the first, second and third fiscal year post IPO
RETURN	Average monthly stock return, in percent, measured over the first, second and third year post IPO

N_M	Number of all managing underwriters
log(P/S)	Natural logarithm of a IPO firm's price to sales ratio, measured at the end of the first, second and third fiscal year post IPO
log(P/EBIT)	Natural logarithm of a IPO firm's price to EBIT ratio, measured at the end of the first, second and third fiscal year post IPO
log((P/S)/(P/S_{ind}))	Natural logarithm of a IPO firm's price to sales ratio divided by the median price to sales ratio of the same industry, measured at the end of the first, second and third fiscal year post IPO; industry classification is as defined in Fama and French (1997)
log((P/EBIT)/(P/$EBIT_{ind}$))	Natural logarithm of a IPO firm's price to EBIT ratio divided by the median price to EBIT ratio of the same industry, measured at the end of the first, second and third fiscal year post IPO; industry classification is as defined in Fama and French (1997)
log(ASSET)	The natural logarithm of pre-IPO assets, adjusted for inflation
$BHRET_{IPO\_firm}$	Buy and hold return of a IPO firm, in percent, measured over the first, second and third year post IPO
$BHRET_{Matched\_firm}$	Buy and hold return of a portfolio, in percent, measured over the first, second and third year post IPO; the portfolio is one of the 25 size and book-to-market portfolios matched to a IPO firm
log(GROSS_SPREAD)	The natural logarithm of underwriter's gross spread, adjusted for inflation
log(OFFSIZE)	The natural logarithm of the size of the offering, measured as offer price multiplied by the number of shares offered, adjusted for inflation
TECHINT	Equal to 1 if the firm is a technology or internet firm, and 0 otherwise
GLOBAL	Equal to 1 if the offering has an international tranche, and 0 otherwise
OVERHANG	(Pre-IPO shares - secondary shares offered)/(total shares offered)
MKTRET	Value-weighted market return on all CRSP stocks for 15 trading days prior to the IPO day, in percent
SENTI_MICH	University of Michigan Consumer Sentimental Index, measured as a monthly average from the filing month to (but not including) the issuing month; if the filing month is the same as the issuing month, we use the value at the month right before the filing month
SENTI_BW	Sentiment Index as in Baker and Wurgler (2007), obtained from Jeffery Wurgler's website, measured as a monthly average from the filing month to (but not including) the

	issuing month; if the filing month is the same as the issuing month, we use the value at the month right before the filing month
△P+	Equal to △P when △P is positive and zero otherwise
△P_D	Equal to 1 when △P is positive and zero otherwise

Table 1: Summary statistics

This table reports mean, median, standard deviation, 10th and 90th percentile of the main variables used in the study. The sample includes the IPOs completed between January 1980 and December 2004 as reported in Thomson Financial's Securities Data Company (SDC) database. We exclude unit offers, closed-end funds, real estate investment trusts (REITs), American Depositary Receipts (ADRs), limited partnerships and offerings with prices below $5. We also require the firms to be covered by CRSP and COMPUSTAT in the issuing year. Variable definitions are provided in the Appendix. We report the summary statistics of the raw variables, without winsorizing, for cases in which our analysis uses the natural logarithm of the variables.

	Mean	Median	STD	P10	P90
MEDIA	2.692	1.452	3.523	0.000	6.667
ABMEDIA	2.140	1.151	3.004	0.000	5.455
N_ANALYST	3.807	3.000	3.752	0.000	8.000
N_INST	28.938	18.000	34.175	1.000	69.000
TURNOVER	8.060	5.425	8.872	1.648	16.969
SIZE	75.902	31.003	232.179	8.419	137.320
RANK	7.054	8.100	3.129	4.100	9.100
AGE	13.398	7.000	18.441	1.000	31.000
VC	0.440	0.000	0.496	0.000	1.000
NASDAQ	0.748	1.000	0.434	0.000	1.000
AMEX	0.036	0.000	0.187	0.000	0.000
ΔP	1.149	0.000	21.667	-23.077	22.727
IPORETURN	19.286	7.143	42.149	-1.250	46.528
ROA	0.044	0.106	0.274	-0.249	0.254
1/PRICE	0.553	0.288	0.852	0.115	1.093
RETURN	0.861	0.869	7.370	-6.152	7.946
N_M	2.421	2.000	1.469	1.000	4.000
P/S	8.106	1.599	27.232	0.335	11.728
P/EBIT	19.331	9.074	38.950	3.258	35.684
ASSET	138.284	8.470	1935.82	1.747	94.744
GROSS_SPREAD	1.067	0.683	1.288	0.226	2.193
OFFSIZE	17.008	8.893	42.931	2.711	29.938
TECHINT	0.377	0.000	0.485	0.000	1.000
GLOBAL	0.156	0.000	0.363	0.000	1.000
OVERHANG	3.095	2.544	2.141	1.150	5.698
MKTRET	0.941	0.929	3.007	-2.847	4.508
SENTI_MICH	93.246	92.750	9.528	79.800	106.400
SENTI_BW	0.236	0.136	0.614	-0.438	1.057
ΔP^{+}	7.800	0.000	16.138	0.000	22.727
ΔP_D	0.418	0.000	0.493	0.000	1.000

Table 2: Analyst following with media coverage

The dependent variables are number of analysts following the stocks (N_ANALYST) at the first, second, and third year end after the IPO. Year dummies are added in the regression while the coefficients are not reported. Reported in the parentheses are standard errors, which are adjusted for clustering by industry measured by four digit SIC codes. Variable definitions are provided in the Appendix. ***, ** and * indicate that the estimated coefficients are significant at 1%, 5% and 10% levels, respectively.

	N_ANALYST					
	Year 1		Year 2		Year 3	
MEDIA	0.103***	0.079***	0.106***	0.089**	0.116***	0.091**
	(0.021)	(0.019)	(0.035)	(0.035)	(0.044)	(0.045)
log(SIZE)	1.353***	0.893***	1.587***	1.321***	1.775***	1.383***
	(0.112)	(0.124)	(0.215)	(0.234)	(0.301)	(0.344)
RANK	-0.016	-0.029	-0.018	-0.027	-0.040	-0.050
	(0.025)	(0.026)	(0.038)	(0.038)	(0.053)	(0.054)
log(1+AGE)	-0.023	-0.099	-0.243**	-0.293***	-0.018	-0.090
	(0.077)	(0.067)	(0.121)	(0.110)	(0.164)	(0.141)
VC	0.222*	0.170	0.726***	0.704***	0.669***	0.656***
	(0.118)	(0.111)	(0.218)	(0.219)	(0.245)	(0.252)
NASDAQ	-0.428**	-0.125	0.126	0.313	0.378	0.621
	(0.203)	(0.185)	(0.349)	(0.336)	(0.559)	(0.542)
AMEX	-0.906***	-0.998***	-0.346	-0.422	-0.807	-1.032
	(0.278)	(0.275)	(0.658)	(0.670)	(0.975)	(0.966)
ΔP	0.004	0.005	0.001	0.002	0.003	0.005
	(0.005)	(0.004)	(0.005)	(0.005)	(0.006)	(0.006)
IPORETURN	0.007***	0.009***	0.010***	0.011***	0.005	0.006
	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)	(0.004)
ROA	0.156	0.193	1.437***	1.379***	1.246***	1.201***
	(0.272)	(0.259)	(0.286)	(0.286)	(0.348)	(0.321)
1/(PRICE)	-0.209	-0.192	-0.942***	-0.925***	-1.160***	-1.148***
	(0.152)	(0.118)	(0.127)	(0.125)	(0.169)	(0.163)
RETURN	7.600***	7.461***	-3.446**	-3.346*	-6.512***	-6.455**
	(1.303)	(1.205)	(1.721)	(1.738)	(2.472)	(2.624)
N_M		0.769***		0.456***		0.631***
		(0.102)		(0.123)		(0.183)
LAMBDA		-0.028		0.030		0.146
		(0.084)		(0.104)		(0.125)
N	1662	1662	1351	1351	1057	1057
R^2	0.43	0.49	0.34	0.35	0.31	0.33

Table 3: Number of institutional investors with media coverage

The dependent variables are number of institutional investors holding the stocks (N_INST) at the first, second, and third fiscal year end after IPO. Year dummies are added in the regression while the coefficients are not reported. Reported in the parentheses are standard errors, which are adjusted for clustering by industry measured by four digit SIC codes. Variable definitions are provided in the Appendix. ***, ** and * indicate that the estimated coefficients are significant at 1%, 5% and 10% levels, respectively.

	N_INST		
	Year 1	Year 2	Year 3
MEDIA	0.408**	0.933***	0.699**
	(0.160)	(0.211)	(0.277)
log(SIZE)	11.899***	14.938***	17.506***
	(0.724)	(0.876)	(1.100)
RANK	-0.107	-0.294**	-0.319**
	(0.108)	(0.147)	(0.151)
log(1+AGE)	0.696*	0.234	-0.874
	(0.395)	(0.636)	(0.731)
VC	1.461**	4.883***	6.327***
	(0.658)	(1.040)	(1.281)
NASDAQ	-4.093***	-6.276***	-7.873***
	(0.895)	(1.350)	(1.567)
AMEX	-3.410***	-7.324***	-9.003***
	(1.247)	(1.918)	(2.610)
ΔP	0.041**	0.015	0.067
	(0.016)	(0.036)	(0.051)
IPORETURN	0.082***	0.051***	0.008
	(0.009)	(0.020)	(0.019)
ROA	6.323***	9.245***	13.274***
	(1.617)	(2.476)	(2.734)
1/(PRICE)	-4.544***	-10.200***	-10.433***
	(0.609)	(0.770)	(0.856)
RETURN	0.731***	0.366***	0.079
	(0.058)	(0.072)	(0.095)
N	3108	2864	2532
R^2	0.61	0.56	0.54

Table 4: Liquidity measures with media coverage

The dependent variables are natural logarithm of turnover ratio (log(TRUNOVER)) over the first, second and third year post IPO. Year dummies are added in the regression while the coefficients are not reported. Reported in the parentheses are standard errors, which are adjusted for clustering by industry measured by four digit SIC codes. Variable definitions are provided in the Appendix. ***, ** and * indicate that the estimated coefficients are significant at 1%, 5% and 10% levels, respectively.

	log(TURNOVER)		
	Year 1	Year 2	Year 3
MEDIA	0.016***	0.015**	0.011*
	(0.005)	(0.006)	(0.007)
log(SIZE)	-0.041**	0.063**	0.089***
	(0.021)	(0.026)	(0.029)
RANK	0.002	-0.002	-0.009
	(0.005)	(0.007)	(0.008)
log(1+AGE)	-0.035***	-0.063***	-0.075***
	(0.013)	(0.018)	(0.021)
VC	0.272***	0.443***	0.538***
	(0.033)	(0.042)	(0.041)
NASDAQ	-0.030	0.042	0.057
	(0.038)	(0.043)	(0.050)
AMEX	0.043	-0.001	-0.142
	(0.089)	(0.093)	(0.108)
ΔP	0.006***	0.002**	0.002
	(0.001)	(0.001)	(0.001)
IPORETURN	0.002***	0.003***	0.002***
	(0.001)	(0.001)	(0.001)
ROA	0.110	0.203**	0.117*
	(0.105)	(0.080)	(0.068)
1/(PRICE)	-0.126***	-0.204***	-0.216***
	(0.032)	(0.026)	(0.024)
RETURN	0.022***	0.017***	0.015***
	(0.003)	(0.003)	(0.003)
N	3108	2864	2532
R^2	0.34	0.31	0.31

Table 5: Long run valuation with media coverage and price revision

The dependent variables are the natural logarithm of valuation ratios of the IPO firms. The left panels use raw valuation ratios, while the right panels use the ratios divided by the industry median ratios. Industry classification is as defined in Fama and French (1997). The valuation ratio is measured by price-to-sales ratios in Panel A, price-to-EBIT ratios in Panel B. Firms with negative ratios are not considered. Year dummies are added in the regression while the coefficients are not reported. Reported in the parentheses are standard errors, which are adjusted for clustering by industry measured by four digit SIC codes. Variable definitions are provided in the Appendix. ***, ** and * indicate that the estimated coefficients are significant at 1%, 5% and 10% levels, respectively.

Panel A. Price-to Sales ratios

	log(P/S)			log((P/S)/(P/S_{ind}))		
	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
MEDIA	0.024***	0.027***	0.030***	0.025***	0.023***	0.024***
	(0.008)	(0.008)	(0.009)	(0.007)	(0.008)	(0.008)
log(ASSET)	-0.264***	-0.205***	-0.204***	-0.223***	-0.179***	-0.161***
	(0.025)	(0.028)	(0.027)	(0.019)	(0.020)	(0.021)
RANK	0.031***	0.032***	0.034***	0.030***	0.032***	0.036***
	(0.009)	(0.008)	(0.010)	(0.007)	(0.007)	(0.009)
log(1+AGE)	-0.206***	-0.144***	-0.108***	-0.145***	-0.075***	-0.042*
	(0.024)	(0.028)	(0.028)	(0.023)	(0.025)	(0.024)
VC	0.417***	0.583***	0.566***	0.191***	0.315***	0.321***
	(0.061)	(0.068)	(0.088)	(0.045)	(0.045)	(0.059)
NASDAQ	-0.070	-0.072	-0.123	-0.066	-0.073	-0.092
	(0.059)	(0.074)	(0.082)	(0.050)	(0.061)	(0.065)
AMEX	-0.391***	-0.410***	-0.582***	-0.367***	-0.413***	-0.531***
	(0.116)	(0.125)	(0.139)	(0.104)	(0.108)	(0.125)
ΔP	0.006***	0.004*	0.002	0.005***	0.004**	0.002
	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
IPORETURN	0.004***	0.001	0.001	0.004***	0.002*	0.002***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
ROA	-1.348***	-0.651	-0.565	-0.840***	-0.213	-0.123
	(0.346)	(0.410)	(0.372)	(0.218)	(0.285)	(0.253)
N	3024	2801	2484	3024	2801	2484
R^2	0.42	0.26	0.22	0.29	0.15	0.13

Table 5 Cont.

Panel B. Price-to-EBIT ratios

	log(P/EIBT)			log((P/EBIT)/(P/EBIT$_{ind}$))		
	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
MEDIA	0.027***	0.032***	0.032***	0.023***	0.025***	0.022***
	(0.007)	(0.009)	(0.009)	(0.007)	(0.008)	(0.008)
log(ASSET)	-0.300***	-0.243***	-0.237***	-0.235***	-0.188***	-0.173***
	(0.019)	(0.020)	(0.022)	(0.016)	(0.016)	(0.019)
RANK	0.024***	0.022***	0.009	0.020***	0.019***	0.007
	(0.006)	(0.007)	(0.008)	(0.006)	(0.006)	(0.008)
log(1+AGE)	-0.064***	-0.012	0.013	-0.073***	-0.018	0.002
	(0.016)	(0.018)	(0.021)	(0.015)	(0.017)	(0.019)
VC	0.246***	0.363***	0.344***	0.107***	0.198***	0.203***
	(0.028)	(0.045)	(0.057)	(0.029)	(0.038)	(0.048)
NASDAQ	-0.149***	-0.094*	-0.056	-0.107***	-0.049	-0.028
	(0.040)	(0.053)	(0.054)	(0.033)	(0.042)	(0.044)
AMEX	-0.424***	-0.373***	-0.359***	-0.341***	-0.304***	-0.276**
	(0.081)	(0.089)	(0.128)	(0.073)	(0.083)	(0.120)
ΔP	0.008***	0.008***	0.006***	0.006***	0.006***	0.005***
	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.001)
IPORETURN	0.007***	0.005***	0.004***	0.006***	0.004***	0.003***
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
ROA	-2.773***	-2.470***	-2.459***	-2.714***	-2.504***	-2.393***
	(0.209)	(0.204)	(0.262)	(0.220)	(0.200)	(0.251)
N	2314	2039	1810	2314	2039	1810
R^2	0.52	0.40	0.32	0.41	0.30	0.24

Table 6: Long run returns with media coverage

The dependent variables are the return differences between the IPO firms and benchmark portfolios matched to the IPO companies based on size and book-to-market ratios. Buy and hold returns are measured over the first, second and third year post IPO. For the first year, we begin from the close of the second day that the IPO trades. Reported in the parentheses are standard errors, which are adjusted for clustering by industry measured by four digit SIC codes. Variable definitions are provided in the Appendix. ***, ** and * indicate that the estimated coefficients are significant at 1%, 5% and 10% levels, respectively.

	$BHRET_{IPO\ firm}$-$BHRET_{Matched\ firm}$					
	Year 1		Year 2		Year 3	
MEDIA	-0.246	-0.141	-0.116	0.571	0.832	0.802
	(0.339)	(0.258)	(0.297)	(0.397)	(0.540)	(0.548)
log(ASSET)		1.402**		0.014		-0.474
		(0.567)		(0.883)		(1.222)
RANK		-0.072		0.610*		0.596
		(0.265)		(0.337)		(0.664)
log(1+AGE)		0.142		-0.380		-2.860
		(0.918)		(1.375)		(1.800)
VC		8.300***		16.208***		11.635***
		(1.792)		(3.131)		(4.171)
NASDAQ		-5.138***		-2.339		0.537
		(1.867)		(3.573)		(3.612)
AMEX		-5.027		-7.192		-20.487***
		(4.310)		(6.439)		(7.422)
ΔP		0.067		0.035		-0.151
		(0.069)		(0.107)		(0.102)
IPORETURN		-0.113***		-0.176***		0.020
		(0.021)		(0.033)		(0.038)
ROA		26.424***		44.152***		46.103***
		(7.801)		(9.813)		(8.091)
N	3388	2959	3253	2822	2768	2478
R^2	0.00	0.04	0.00	0.04	0.00	0.03

Table 7: Regression results of media coverage

This table reports regression results while the dependent variables are MEDIA in Panel A and abnormal media (ABMEDIA) in Panel B. Left columns report OLS regression results while right columns report Tobit regression results. Standard errors are reported in the parentheses and are adjusted for clustering by issuing month for OLS regressions. The R^2 for Tobit regression are pseudo R^2. Variable definitions are provided in the Appendix. ***, ** and * indicate that the estimated coefficients are significant at 1%, 5% and 10% levels, respectively.

Panel A: Media coverage

	MEDIA			
	OLS		Tobit	
log(SIZE)	-0.547	-0.397	-0.353	-0.222
	(0.407)	(0.425)	(0.378)	(0.372)
RANK	-0.005	0.006	0.010	0.021
	(0.013)	(0.012)	(0.021)	(0.021)
log(1+AGE)	-0.008	0.064	0.002	0.081
	(0.052)	(0.051)	(0.062)	(0.061)
VC	0.366***	0.362***	0.485***	0.475***
	(0.099)	(0.104)	(0.135)	(0.133)
NASDAQ	0.293*	0.077	0.452***	0.238
	(0.150)	(0.146)	(0.167)	(0.165)
AMEX	0.437**	0.214	0.767**	0.522
	(0.208)	(0.210)	(0.369)	(0.362)
log(GROSS_SPREAD)	0.790	0.117	1.219**	0.628
	(0.607)	(0.567)	(0.614)	(0.633)
log(OFFSIZE)	1.024	1.402**	0.728	1.063
	(0.728)	(0.669)	(0.682)	(0.688)
TECHINT	0.528***	0.302***	0.598***	0.373***
	(0.126)	(0.110)	(0.141)	(0.140)
GLOBAL	1.006***	0.720***	0.951***	0.652***
	(0.227)	(0.220)	(0.193)	(0.192)
OVERHANG	0.479***	0.367***	0.456***	0.347***
	(0.110)	(0.114)	(0.086)	(0.085)
MKTRET		-0.034		-0.033*
		(0.027)		(0.020)
SENTI_MICH		0.051***		0.055***
		(0.009)		(0.007)
SENTI_BW		-0.030		-0.030
		(0.149)		(0.108)
ΔP		-0.013**		-0.025***
		(0.006)		(0.007)
ΔP^+		0.044***		0.053***
		(0.010)		(0.010)
ΔP_D		-0.100		-0.007
		(0.164)		(0.177)
N	3219	3218	3219	3218
R^2	0.27	0.30	0.06	0.07

Table 7 Cont.

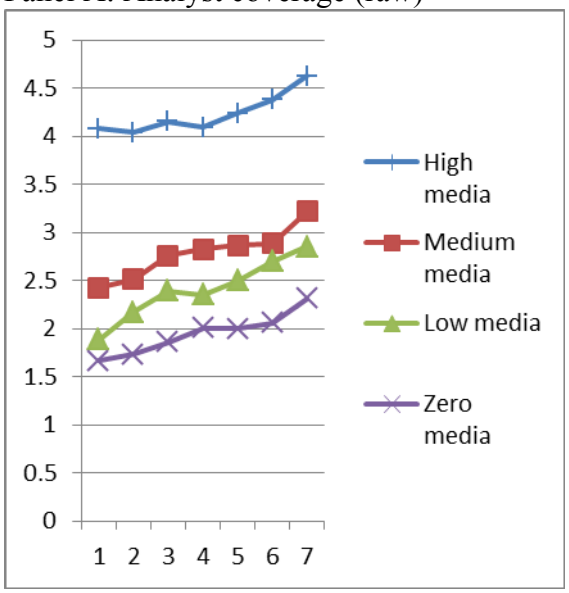
Panel B: Abnormal media coverage

	ABMEDIA			
	OLS		Tobit	
log(SIZE)	-0.515	-0.391	-0.281	-0.171
	(0.359)	(0.381)	(0.347)	(0.343)
RANK	0.008	0.016	0.022	0.031
	(0.012)	(0.010)	(0.020)	(0.019)
log(1+AGE)	-0.013	0.043	-0.012	0.051
	(0.045)	(0.046)	(0.057)	(0.057)
VC	0.165*	0.153	0.241*	0.222*
	(0.093)	(0.098)	(0.124)	(0.123)
NASDAQ	0.200	0.030	0.334**	0.158
	(0.127)	(0.126)	(0.152)	(0.152)
AMEX	0.281	0.105	0.536	0.337
	(0.194)	(0.200)	(0.340)	(0.334)
log(GROSS_SPREAD)	0.552	0.000	0.865	0.317
	(0.534)	(0.512)	(0.561)	(0.581)
log(OFFSIZE)	0.899	1.210**	0.639	0.965
	(0.618)	(0.576)	(0.624)	(0.632)
TECHINT	0.320***	0.136	0.381***	0.188
	(0.113)	(0.104)	(0.129)	(0.129)
GLOBAL	0.672***	0.454**	0.620***	0.384**
	(0.205)	(0.206)	(0.177)	(0.177)
OVERHANG	0.384***	0.291***	0.356***	0.261***
	(0.099)	(0.103)	(0.079)	(0.078)
MKTRET		-0.024		-0.026
		(0.024)		(0.018)
SENTI_MICH		0.037***		0.042***
		(0.008)		(0.007)
SENTI_BW		0.028		0.049
		(0.134)		(0.099)
ΔP		-0.012**		-0.022***
		(0.005)		(0.007)
ΔP^+		0.039***		0.047***
		(0.009)		(0.009)
ΔP_D		-0.084		0.019
		(0.145)		(0.163)
N	3219	3218	3219	3218
R^2	0.20	0.22	0.05	0.05

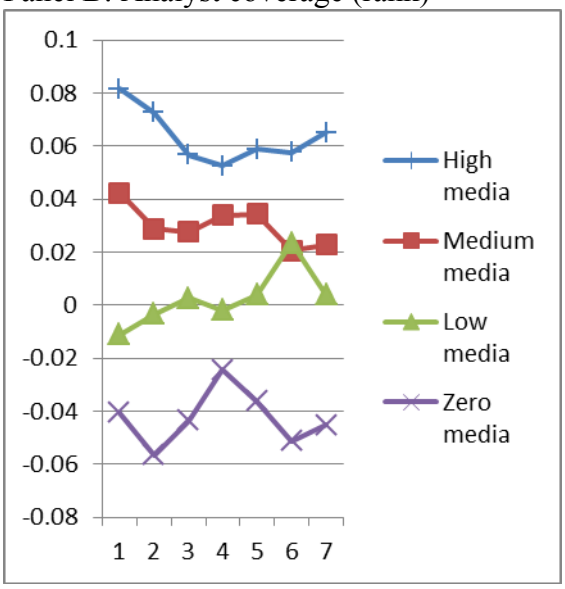
Figure 1 Persistence of Attention

We form IPO firms into four groups based on their media coverage (high media, medium media, low media, and zero media) during the IPO filing periods and measure their analyst coverage and number of institutional owners for up to seven year post-IPO. Raw measures (Panel A and Panel C) are the raw number of analysts or institutions without adjustments. Rank measures (Panel B and Panel D) show the rank of IPO firms against all IPOs issued within a one-year centered window. The rank measures are standardized so that they have a lower (upper) bound of -0.5 (+0.5).

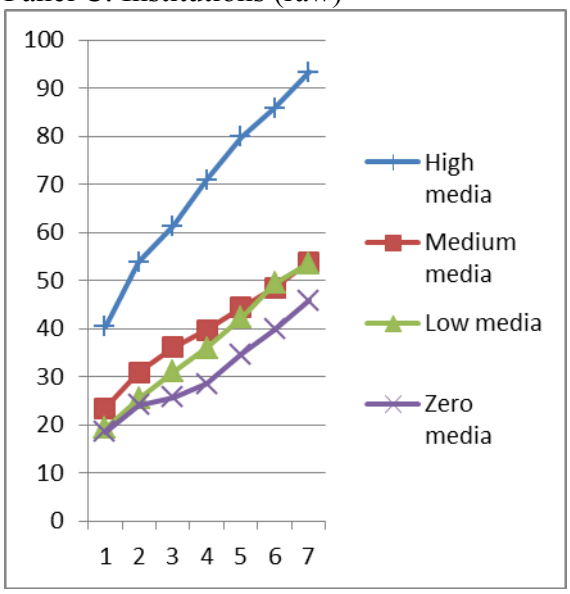
Panel A: Analyst coverage (raw)



Panel B: Analyst coverage (rank)



Panel C: Institutions (raw)



Panel D: Institutions (rank)