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Abstract

We hypothesize that investors in China's market for initial public offerings (IPOs) are influenced by the level of attention given to upcoming offerings. Using a novel data set on analyst coverage, we find that investor attention as proxied by the number of analysts covering a firm drives IPO underpricing. We also show that analyst coverage is positively related with small trading activities during the first trading day. Our results suggest that analysts attract the attention of individual investors, who then drive IPO initial returns and cause related long-term price reversals in the post-IPO market. These findings contradict the argument that a primary role of analysts is to reduce information asymmetry and instead support the attention hypothesis.

JEL Classification: G11; G14; G15; G24

Keywords: Attention; Investor behavior; Behavioral biases; Analyst coverage, Initial public offerings; China

1 Introduction

Why do investors choose to invest in certain stocks while at the same time discarding other possible investments? How do they pick among a vast variety of investment opportunities? Barber and Odean (2008) argue that if there are many alternatives to consider when making a choice, an individual is more likely to consider options that attract more attention. In this paper, we test the conjecture that investors are more prone to invest in IPO listings that are characterized by more analyst coverage. To do this, we analyze the nascent IPO market in China and provide robust evidence that the attention-grabbing phenomenon helps explain what is among the highest levels of IPO underpricing in the world. Our findings suggest that the main effect of analyst coverage in the Chinese IPO market is attracting attention rather than producing new information and reducing information asymmetry in the market.

Going public puts a firm under the microscope of a broad group of investors for the first time. IPO firms are often young, immature and relatively opaque, and as a result characterized with high future uncertainty. It is therefore difficult for investors to estimate their true value. In addition, short selling is often prohibited or extremely costly in connection to an IPO event (Miller, 1977; Houge et al., 2001; Geczy et al., 2002; D'Avolio, 2002; Ofek and Richardson, 2003; Edwards and Hanley, 2010). As a result, the aftermarket price of IPOs is often driven by optimists, leading to

overpricing. However, most studies implicitly assume that early aftermarket prices of IPO stocks reveal the intrinsic value of the issuing firm (e.g. Baron, 1982; Rock, 1986; Welch, 1989; Benveniste and Spindt, 1989). It can then be argued that IPO underpricing is used deliberately to compensate uninformed investors (e.g. Rock, 1986). If this holds true, then why do IPO stocks often exhibit poor returns in the long run? Contrary to earlier studies, we do not assume that stock prices shortly after IPOs are necessarily reflecting the true value of newly listed firms. Instead, we believe that it is possible to explain IPO underpricing with a hypothesis based on bounded rationality. We argue that investors are prone to pay more attention to certain stocks. As there are short-selling restrictions in the IPO aftermarket, increased attention pushes early aftermarket prices higher, leading to an overshooting of prices which in turn results in underpricing and long-term poor performance effects.

We use analyst coverage in the new issue market as proxy for investor attention to show that the more analysts cover a firm prior to going public in China, the higher the IPO first-day return.² This finding cannot be explained by different theories based on information asymmetry as they all share the expectation that less asymmetry of ex ante information leads to lower ex post underpricing (Ritter and Welch, 2002). We also find that IPOs characterized by both a high first-day return and high analyst

² Previous studies have used different forms of observable measures that are likely to be associated with attention-grabbing events: news, unusual trading volume, extreme returns (e.g. Barber and Odean, 2008; Hillert and Ungeheuer, 2016).

coverage exhibit worse long-run stock return performance after an IPO. We argue that the attention-grabbing hypothesis can account for these results as analyst coverage attracts individual investors' attention. The effect is an attention-induced buying pressure that results in a higher initial return and a subsequent price reversal. We also find that analyst coverage is significantly correlated with small trading activities. This suggests that individual investors may be a driver for higher IPO initial returns, further corroborating the behavioral hypothesis of underpricing. Finally, we show that the results are robust to potential endogeneity issues and alternative sentiment-based explanations.

How is it possible to attract the attention of investors who consider different investment opportunities? One of the tenets of the traditional efficient market hypothesis is that decision makers face a well-defined set of alternatives and carry out a rational decision based on the premise that they maximize their utility function. However, given that so many different factors may impact asset prices, and given that the complete set of investment choices is so large, it is unlikely that investors are able to consider the full set of investment choices. Previous research has suggested that investors tend to limit a set of investment choices by focusing on shares that have caught their attention. For example, Odean (1999) argue that securities that have performed unusually well or poorly will attract investors' attention and are, as a result, more likely to be traded due to this attention. Barber and Odean (2008) suggest that buyers face the problem of having to limit their choice set more than sellers, as sellers

typically hold relatively few stocks and are relatively well informed about the stocks they currently have in their portfolio. They also argue that challenges investors are facing differ depending on investor type. Institutional investors are able to allocate large amounts of resources to their investment choices, and they tend to search for information for buy and sell options more equally. For individual investors, on the other hand, attention is a scarce resource, and as a result, they have to limit their choice set much more. Following this reasoning, we argue that analyst coverage acts as a signal to investors who need to limit their choice set in order to make investment decisions.

China is a desirable setting to examine the behavioral explanation based on attention grabbing for several reasons. First, Ritter's (2003) survey shows that China ranks top among 38 countries with an average IPO initial return of 256.9%. Other studies also point towards very high IPO underpricing in China, which suggests that Chinese issuing firms leave considerable amount of money on the table (Mok and Hui, 1998; Su and Fleisher, 1999; Yu and Tse, 2006; Chan et al., 2004; Cheung et al., 2009; Tian, 2011). Similar to the experience in the U.S. during the internet bubble in 1999-2000, this level of underpricing appears to be too high to simply constitute a deliberate action taken by the issuing firm.³ Second, China's securities market is

³ If underpricing is used to compensate uninformed investors for their participation in the primary market or incentivize bidders to reveal the true information in the book-building process, it would not result in such a low IPO offer price. For more on deliberate underpricing, see, among others, Rock (1986) and Benveniste and Spindt (1989).

characterized by a very high level of speculation (Mei et al., 2009; Xiong and Yu, 2011). Third, The Chinese stock market constitutes an especially suitable setting for this type of analysis as retail (or individual) investors are responsible for an unusually large proportion of the turnover (e.g. Johansson and Ljungwall, 2009). In fact, they have been shown to contribute to 80% of total market trading volume (Shenzhen Stock Exchange, 2012). Retail investors are often described as sentimental investors or noise traders, prone to heuristics and different types of biases including overconfidence and limited attention. Fourth, short selling in China is limited to a set of larger stocks and it is not possible to sell short in the post-IPO market.⁴ This limits the opportunities for arbitrage, which means that China provides a suitable setting to analyze a behavioral explanation for underpricing.

This study contributes to several strands of literature. First, it builds on previous research on IPO underpricing. Besides previous contributions that apply rational explanations (e.g. Baron, 1982; Rock, 1986; Welch, 1989), a few studies have used behavioral approaches to analyze underpricing. For example, Loughran and Ritter (2002) use prospect theory to explain IPO underpricing. Contrary to our study, their approach stresses behavioral biases among decision-makers of the IPO firm rather than among investors. This type of reasoning may help explain the existence of IPO

⁴ Short selling was introduced through a new pilot program on March 31, 2010, but was limited to 90 blue-chip stocks. The number of stocks in the program was expanded to 278 on December 5, 2011, 500 on January 31, 2013, and 700 on September 16, 2013. However, new IPO stocks are not included and thus not allowed to be sold short.

underpricing but does not shed light on the extent of it, which is the focus of our study. Theoretical models by Derrien (2005) and Ljungqvist et al. (2004) do explain IPO underpricing from the perspective of investor bias, but they focus on the role of general sentiment. These theories are difficult to test empirically as both beliefs and fundamental values are unobservable. What separates our study from the existing literature is that it moves away from investor sentiment in general and instead focuses on the limited attention of sentimental investors. That is, we concentrate on one potential mechanism to generate sentiment, thereby obtaining new insights into investor sentiment.

Second, this study contributes to the research on the relationship between analysts and IPOs (Rajan and Servaes, 1997; Michaely and Womack, 1999; Krigman et al., 2001; Cliff and Denis, 2004; Das et al., 2006). Previous studies primarily discuss analyst behavior in the post-IPO market, with analysts taking actions such as providing booster shots when firms trade poorly and initiating coverage to build price momentum. Our focus is instead on analysts in the new issue market, a hitherto unexplored but important issue. Pre-IPO firms are often relatively opaque, which means that analysts should be able to play a vital role in the IPO process by helping to alleviate information asymmetry. However, we instead find that analyst coverage plays a dominant role when it comes to attracting investors' attention rather than producing new firm-specific information. This study therefore provides insight into an important side effect of analyst coverage, in this case in an environment characterized

by high uncertainty. Analysts can of course produce information and hype up the market at the same time. The dominance of attention grabbing effect does not mean that the information production effect does not exist at all. In this sense, our findings suggest that we should not take the argument that analysts always produce and disseminate new information for granted.

More generally, this study also complements the literature on the role of analysts as that literature has yet to discuss analyst coverage in the IPO primary market. A key reason behind the lack of research in this area is because almost no analysts in U.S. issue this type of reports due to the so-called quiet period rules. A unique dataset from the Chinese IPO market enables us to fill this void in the literature.

Third, this study adds to existing research on IPO underpricing in China. Prior studies find that Chinese IPO initial return is extremely high (Mok and Hui, 1998; Su and Fleishe, 1999; Yu and Tse, 2006; Chan et al., 2006; Chang et al., 2008; Cheung et al., 2009; Zhou and Zhou, 2010; Yan, 2010; Tian, 2011). However, these studies have only made limited contributions to the understanding of the underlying mechanism. Tian (2011) argues that Chinese IPO underpricing is in principle caused by different forms of government intervention, including direct control of the offer price and share supply. While this explanation is insightful, his 1992-2004 sample is characterized by a strictly controlled offer price. After that period, book-building was implemented in China. We thus explore this research question in a considerably more market-oriented setting. Last but not least, we find that market misvaluation is a dominant force in

determining IPO initial returns in China. Although this finding is at odds with the efficient market hypothesis, it has significant policy implications for regulators who need to understand investor behavior in order to protect the interests of minority investors in China.

The rest of this study is organized as follows: Section 2 introduces the institutional setting, focusing on China's IPO market and the evolution of the Chinese analyst industry. It also provides a brief discussion on the issue of analyst coverage and IPO initial and long-term returns. Section 3 describes the data sets and the variables. Section 4 presents empirical evidence of attention-driven trading by focusing on IPO initial returns, post-IPO returns, and small trading activities. Section 5 provides robustness checks by first introducing the results of an instrumental variable analysis and then discussing an alternative hypothesis based on investor sentiment. Finally, Section 6 concludes the study.

2 Setting

2.1 China's IPO Market

Reestablished as part of the economic reforms in the beginning of the 1990s, China's stock market is highly regulated by the government, not the least when it comes to the IPO market. Prior to 1998, the offer price was most often fixed to a price-to-earnings ratio set by China Securities Regulatory Commission (CSRC), which typically landed within the range of 12 to 15. The government rather than the

market also determined which firms were eligible to go public and the amount of ownership that should be offered to the market. One implication of this early regulatory setting was that the average initial return on IPOs was very high (Tian, 2011).

The enactment of the Securities Law in 1999 signaled a new stage in the development of a market-oriented issuance mechanism. The old IPO quota system was abandoned and a new IPO approval system (*he zhun zhi*) was implemented, which eased up the previously so strictly regulated IPO process. The formal introduction of a sponsor system in 2003 and a price inquiry mechanism in 2004 further pushed investment banks to perform a more comprehensive due diligence when underwriting and make the offer price almost completely determined by market.⁵ Moreover, the book-building mechanism was introduced at this time, a change that effectively transformed a pricing method that had been in use for decades.

Commonly used in developed markets, book building is a process that aids price and demand discovery. During this process, bids are collected from potential investors, after which the issuing price of new shares is determined. Book runners in China, on the other hand, have no discretion in allocating shares to preferred investors. As a

⁵ For more information on the sponsor system and the price inquiry system, see the official documents *Provisional Measures of Sponsor System on Securities Issuance and Listing*, *CSRC Circulation on Matters related to the Trial of Share Price Inquiry system in IPOs*, and *Memo on the Standards of Share Issuance Reviewing No. 18 – Regulatory Requirements on The Conditions and Behavior of IPOs shares price inquiry Objects*.

result, bidders' incentive to tell the truth about their real demand is reduced (Feng and Johansson, 2015). In fact, book runners must first allocate shares on a pro rata basis in proportion to their bid size. The remaining shares are then allocated to public investors online at a uniform price, which is normally the offer price. This effectively makes the IPO offering mechanism in China a hybrid of the book-building and fixed-price methods and it thus differ quite significantly from the mechanism used in the U.S. and other developed markets. The Third Plenary Session of the 18th Communist Party of China Central Committee in October 2013 mapped out a continued reform of public offerings which emphasizes a registration-based system for new issues. If this reform is carried out, the IPO mechanism will become significantly more market oriented and similar to the ones typically found in developed markets.

2.2 *China's Analyst Industry*

After China reopened its stock market in the early 1990s, the number of listed firms and investors soared, which in turned resulted in an increasing demand for information intermediaries such as financial analysts. During the initial stage of 1991-1997, financial analysts, often called securities consultants at the time, began to provide investors with information on government policies, technical trends, firm prospects, and stock recommendations. Due to a lack of regulation and supervision, analysts also began to collude with large investors and disseminate misleading or even deceptive information in order to expropriate individual investors. This behavior has

earned them a notorious nickname in China: *hei zui* or “black mouths” (e.g. Fenby, 2012).

In 1998, the so-called Interim Measures for Administration of Securities or Futures Investment Consultancy came into effect. This regulation introduced the legitimacy and eligibility for analysts and enabled the control of whether analysts comply with a code of ethics. Since then, well-trained graduates from leading universities have been recruited as analysts, resulting in a gradual improvement of the profession. However, these improvements take time, and new cases of illegal behavior and wrongdoings are discovered from time to time.

China entered into the WTO in 2001 and launched a Qualified Foreign Institutional Investors (QFII) program the following year as part of the agreement for its membership. One result of the establishment of the QFII program was that the demand for financial analysis increased significantly. This trend was further strengthened by the fact that the growth of the domestic mutual fund industry practically exploded around this time. As a result, the number of registered analysts reached 1,215 by the end of 2011, and 162,357 analyst reports were published in that year alone (SAC, 2012). However, this rapid development has come at a price. An overall deterioration in research quality has been driven by fierce career competition among analysts. In fact, analyst report scandals involving greatly exaggerated firm prospects or misleading key information have been reported by the media on numerous occasions in recent years.

2.3 Analyst Coverage and IPO Initial and Long-Term Returns

IPOs involve the sale of shares in closely-held firms in which insiders may have access to non-public information. One implication of this is that a fair disclosure of material information is crucial for investor protection, which is why so-called quiet period (or waiting period) rules are used in the U.S. These rules imply a quiet period from the time a company files a registration statement with the SEC until the SEC has declared that the registration statement is in effect. During the quiet period, the information a company and its related parties can release to the public is limited by federal securities laws. As a result, it is typically difficult for investors to find important information outside the scope of what is disclosed in the official prospectus.

After the prospectus is issued, company management and investment bankers launch marketing campaigns to promote the IPO. Management typically goes on a road show, during which it travels to different cities and gives presentations to analysts, fund managers and potential investors. Direct access to Q&A sessions with management is also included to help investors and analysts get a better understanding of the firms and their future prospects. The specific types of information that are disclosed during road shows and how they differ from the information found in the IPO prospectuses is beyond this study, but recent studies suggest that face-to-face informal interaction with management can be advantageous for investors (Bushee et al., 2012; Solomon and Soltes, 2015; Kirk and Markov, 2016; Green et al., 2014).

Individual investors are often excluded from these activities. How, then, will they obtain information that is not provided in the prospectus?

In the case of China, analyst reports constitute one additional source of information for investors that are considering investing in the IPO market.⁶ This is because, contrary to their U.S. counterparts, Chinese analysts often initiate coverage of a firm when it goes public. In fact, during the book-building phase, underwriters often issue a valuation report on the IPO firm first, followed by coverage of other analysts. Subsequent reports by other analysts are often labelled pricing, inquiring, or purchasing strategies, but can also be called investment analysis report, research report, valuation report, etc. These reports are succinct and focused, typically only two or three pages long, and may include information on the firm's business model,

⁶ It should be noted that the SEC does not require that analysts from non-affiliated analyst firms abstain from publishing reports on IPO firms. In reality, however, analyst reports on stocks in the new issue market are seldom found in the U.S. Also, as stated by Hrnjic and Sankaraguruswamy (2011), analysts can start coverage before an IPO in European markets. Although the Chinese book-building process is similar to its counterpart in the U.S., it is distorted due to a lack of supporting institutions. For example, a quiet period is not strictly executed in China. The quiet period in China refers to the period from when the firm submits the preliminary prospectus to CSRC until CSRC approves it. IPO firm on the Chinese growth enterprise board must obey the quiet period rule according to the *Administrative Measures for Initial Public Offerings and Listing on the Growth Enterprise Market*. The quiet period rule was introduced for the main board in May 18, 2012 when CSRC promulgated the *Measures for the Administration of Securities Offering and Underwriting* (2012 Revision). According to Shanghai Securities News (May 30, 2012), it is common that the quiet period rule is violated and the authorities typically do not punish this type of violation.

prospects, industry position, and financial forecasts. What is more important for potential investors, the forecasted offer price or closing price on the first trading day, or a forecasted price range are provided on the front page. These reports are generally accessible on popular financial websites such as Hexun, JRJ, Sina Finance, Baidu Finance and QQ Finance. In addition, report summaries are disseminated through financial terminals. This means that individual investors can easily get access to the reports and their main findings.

If one assumes that analyst coverage in the new issue market can help reduce information cost for individual investors⁷, IPO underpricing should be negatively related with the number of analysts covering a firm as this will likely reduce information asymmetry (Ljungqvist, 2005). However, if one carefully reads analyst reports on IPO firms in China, many of these reports are actually almost identical in nature. In fact, plagiarism and trivial disclosure in the analyst industry is widely discussed in Chinese media (e.g. Nanfang Metropolis Daily, 2011; China Business Journal, 2011; The South Review, 2011; Money Week, 2011). When talking to senior analysts and investment bankers, we were informed that these reports are often compiled based on the prospectus, road show slides, and valuation reports presented by underwriters, without additional due diligence work and independent analysis. The informativeness of this type of reports can thus be seen questionable. If the average

⁷ As suggested by studies that focus on deliberate underpricing (e.g. Baron, 1982; Rock, 1986; Welch, 1989).

quality of analyst reports is poor, the hypothesis that analyst coverage will reduce information asymmetry needs to be reconsidered as the existence of analyst reports does not automatically guarantee that investors will be receiving new valuable information.

But how, then, do analysts influence investors in the Chinese IPO market? One plausible effect stems from grabbing investors' attention. Barber and Odean (2008) argue that individual investors tend to buy stocks that attract their attention in some way. For example, an investor can be attracted to a stock after reading or hearing about it in the news, or seeing that it is exhibiting an abnormal trading volume or extreme one-day returns. Studies by Seasholes and Wu (2007), Engelberg and Parsons (2011), Engelberg et al. (2011), and Berkman et al. (2011) provide evidence on the importance of attention in buying behavior of individual investors. Barber and Odean (2008; 2013) attribute this phenomenon to attention-grabbing. That is, stocks that can be easily identified by individual investors are more likely to enter the investors' choice sets, resulting in more investments in these stocks.

When it comes to China's IPO market, if more analysts cover a stock, this in itself is likely to attract the attention of investors. For reasons discussed earlier in this section, this is likely the case even if the reports themselves do not contain material information. Most individual investors are only able to purchase IPO stocks that attract their attention after the stocks have been made available in the secondary market. We therefore argue that the buying pressure resulting from an increased level

of attention by individual investors becomes apparent once trading starts. Since it is impossible to short sell IPOs in China, the buying pressure from individual investors can contribute to significantly higher first-day returns. Subsequently, when the price pressure induced by investor attention gradually dissipates, stock prices eventually reverse, resulting in long-run IPO underperformance.

3 Data and Variables

3.1 Data Source

To examine the effect of analyst coverage on IPO initial returns in the primary issue market, we focus on A-share firms that are listed on one of China's two stock exchanges between 2006 and 2012. There are several reasons for why we choose to start the sample period in 2006. First, as mentioned in Section 3.1, book-building was introduced in the Chinese IPO market in 2004. Before this change, the IPO offer price was heavily regulated by the government. It thus failed to reflect market information, which is why offers in the primary market before this regulatory change are ill suited for testing hypotheses on investor behavior in the IPO market. Second, the non-tradable share reform was officially initiated in April, 2005.⁸ As a direct result of this reform, the CSRC imposed formal suspensions of new offerings from June 7, 2005 to

⁸ For more information on this reform, see the official document *Notice of the China Securities Regulatory Commission on Piloting the Share-trading Reform of Listed Companies*. Li et al. (2012), Liu and Tian (2012) discusses the reform in more detail.

June 19, 2006. Third, before 2006, the analyst industry was still in an embryonic form and came to develop rapidly as evidenced by the soaring number of analysts and the need to improve professional standards. Thus, using data from the earlier period could potentially lead to significant biases in the results.

The key variable in this study is analyst coverage in the new issue market. We manually collect this information by screening original analyst reports from GTA, a global provider of Chinese financial market data. By screening the analyst reports, we can identify whether and how many reports were reported during the period from the prospectus issuing date to the day prior to trading in the IPO stock.⁹ Analyst reports disclose issuing date and analyst name, which make them suitable for our analysis.

Information on IPOs, including offer and listing dates, is extracted from the China Security Market and Accounting Research (CSMAR) database. We also gather transaction level data from China Securities Market Trade and Quote Research Query System (CSMTAQRQS), a high-frequency database provided by GTA. Similar to the New York Stock Exchange Trades and Quotations (TAQ), it contains intraday trades and quotes for all traded stocks in China. The Shenzhen Stock Exchange began publishing high-frequency trade information on December 5th, 2006 and Shanghai

⁹ Three dates are announced during the IPO process in China: the prospectus issuing date, the offer pricing date, and the first trading date. These refers to when the IPO prospectus is issued, when the offer price is set by lead underwriters after the road show, and when shares are publicly traded in the secondary market. Our main results hold up qualitatively even if we confine analyst coverage to the period between the offer pricing date and the first trading date.

Securities Exchange began providing this information on May 4th, 2010. We thus have to analyze a somewhat reduced sample size when we examine the relationship between analyst coverage and small trading activities. Finally, accounting and stock price data are collected from the CSMAR database.

3.2 *The Sample*

Table 1 presents summary statistics for the data sample. After deleting observations due to missing values, the final sample size is 1,075 IPO observations. Panel A shows the distribution of A-share IPOs in China by year. The number of IPOs per year is not evenly distributed throughout the period, mainly because CSRC occasionally imposes formal suspensions of IPOs. For example, IPOs were suspended from 25 May 2005 to 2 June 2006 to support the non-tradable share reform. As a result, the number of IPOs in that 2006 was merely 65. Similarly, following the outbreak of the global financial crisis, new IPOs were suspended from 16 September 2008 to 17 June 2009. Thus, the number of IPOs was only 76 and 102 in 2008 and 2009, respectively. From 13 November 2012 to 30 December 2013, IPOs were once more suspended because of comprehensive financial inspections by the regulatory authorities. Thus, even though a book building process with offer prices that are mainly determined by the market has been used during the time period in our analysis, the IPO pattern in China is still a direct result of government control.

Panel A also presents the number of analysts covering firms in the new issue market. The mean and median for the total sample is 11.99 and 12, respectively. The

years of 2007 and 2009 are characterized by the second highest and highest level of analyst coverage, respectively. These highs also coincided with market returns that exceeded 100%. Analyst Coverage plunged in 2011 and 2012, with corresponding market returns down to -21.35% and 5.1%, respectively.

Panel B presents the industry distribution of the sample following CSRC's classification standards after a revision in 2001. Out of the total 1,075 IPO firms, 267 firms are concentrated in the machinery manufacturing sector. The second largest sector is information technology, with 128 IPO firms. However, the finance sector tops analyst coverage, possibly due to its high visibility and its many offerings characterized by very large deal sizes. In terms of number of analysts covering IPO stocks, the transportation sector comes second, followed by the real estate sector. The interest in these sectors is likely at least partly a result of a long-lasting expansion in domestic infrastructure and a housing market that has been booming for over a decade, features that in turn have fueled investor interest in transportation and real estate firms.

[TABLE 1]

3.3 Variables

The main variables and their summary statistics are presented in Table 2. The mean value for each variable is tabulated for the full sample and its corresponding median value is given in parenthesis. For each year, IPO firms are partitioned into three groups based on the number of analysts covering them. The groups contain firms with low, medium and high analyst coverage, corresponding to below 33.33%,

between 33.33% and 66.67% and above 66.67% of analyst coverage for each year. We then pool all the years together for each group to form the final subsamples. These three subsamples contain 373, 302, and 400 IPOs. On average, there are 6.40, 11.54, and 17.53 analysts covering the firms in the three subsamples. The final column presents tests for difference in the mean (T-test) and median (Wilcoxon-Mann-Whitney test) of the Low and High analyst coverage samples. The test results show that the difference in analyst coverage between the two subsamples is significant at the 1% level. The smallest value of analyst coverage is 1 and the largest is 32 (not reported in the table). All IPOs in the sample are thus covered by analysts.

IPO initial return, measured as the percentage change from the IPO offer price to the first-day closing price, is 63% on average. IPO initial return is 14%, 56% and 113% for the subsamples of low, medium, and high numbers of analyst coverage, respectively. The difference in IPO initial return between low and high analyst coverage is significant at the 1% level. These initial tests thus suggest that the initial return tends to increase with the number of analysts covering an IPO firm.

Table 2 reports one-year *buy-and-hold abnormal returns (BHARs)* against different benchmarks. Similar to existing studies on long-run post-IPO performance (e.g. Ritter, 1991; Loughran and Ritter, 1995), IPO stocks on average underperform against the different benchmarks. The newly listed firms perform an average 26% worse than the equally weighted index, 11% worse than the tradable weighted index, and 6% worse than a matching portfolio based on firm size and the book-to-market

ratio. More importantly, the exploratory tests for the difference in BHARs between the low and high analyst groups suggest that post-IPO BHARs are negatively associated with analyst coverage.

When examining the relationship between analyst coverage and IPO performance, other potential IPO- and firm-specific factors need to be considered and are therefore included in the analysis. Because there is a time lapse between the offering and listing dates, we include *market return*, measured as the tradable value weighted return of all A-share stocks in China from the offering date to the first trading date. This is primarily to control for the potential effect of the general trend in the stock market on the initial return (Hanley, 1993; Lowry and Schwert, 2004; Kutsuna et al., 2009). During the sample period, the average value of the market return during the period between the offering and listing dates is 0.34%. Tests for differences in the mean and median show that the market return was significantly higher in the high analyst coverage subsample compared to the low analyst coverage subsample at the 1% level.

A substantial body of work examines the effects of underwriter reputation on IPO initial return (Beatty and Ritter, 1986; Titman and Trueman, 1986; and Maksimovic and Unal, 1993; Beatty and Welch, 1996; Cooney et al., 2001; Logue, et al, 2002) and long-run stock performance (e.g. Carter et al., 1998). So-called tombstone advertisements, which often rank order underwriters' relative placements, do not exist in China. This means that we cannot calculate the commonly-used Carter-

Manaster (1990) measure and instead have to use an alternative proxy for underwriter reputation. We therefore create the variable *reputable underwriter*, which equals one if the total amount of IPO shares sold or the total number of IPOs the underwriter underwrote during the previous three years is among the top 10% and zero otherwise. The proxy for underwriter reputation in this study is thus similar to measures found in studies by Megginson and Weiss (1991) and Cooney et al. (2001), who use the relative market share of the underwriters. Table 2 shows that investment banks with strong reputation underwrote 17% of the total number of IPOs in the sample. For the IPOs in the low analyst coverage subsample, only 13% are underwritten by reputable banks, compared to 22% for IPOs in the high analyst coverage subsample. Tests for difference among the subsamples show that the proportion of reputable underwriters for IPOs was significantly higher in the high analyst coverage subsample.

Besides underwriter reputation, the quality of the reporting and auditors are also discussed in the IPO literature (Beatty, 1989; Titman and Trueman, 1986; Michael and Shaw, 1995; Balvers et al., 1988; Beatty, 1989; Datar et al., 1991; Feltham et al., 1991). Similar to existing studies, we use the dummy variable *big4*, which equals one if the auditor is one of the big four international accounting firms (Deloitte, Ernst & Young, KPMG, and Pricewaterhouse Coopers) and zero otherwise. We use this as a proxy for the auditor's reputation, as well-known international accounting firms are likely to convey auditing of high quality. In the total sample, 6% of the IPO firms are audited by one of the big four firms. The same is true for only 2% of the IPO firms in

the low analyst coverage subsample, while the corresponding ratio is 10% for the high analyst coverage subsample. Tests for differences show that firms characterized by high analyst coverage use more reputable auditors and the difference is significant at the 1% level.

Benveniste and Spindt (1989) suggest that changes in the offer price between the filing of the preliminary prospectus and the offer date are a result of underwriters gathering information during the book building process and can proxy for investor demand during the pre-issue period. We therefore include this variable as well. Similar to what is found in studies by Hanley (1993) and Cornelli and Goldreich (2001), we use *price revision*, defined as the percentage change between the finalized offer price and the expected offer price.¹⁰ The results in Table 2 indicate that IPO firms have an offer price that are, on average, 16% above the expected offer price. They also show that price revision is higher for firms characterized by more analyst coverage, with an average mean value of 0.08, 0.15, and 0.25, respectively, for the three subsamples.

The final IPO-specific variable is *offer ratio*, measured as the ratio of shares offered in the IPO to total shares. Table 2 shows that the offer ratio is similar for the

¹⁰ The IPO offer price range is not disclosed in China as it is in the U.S., which means that we cannot use the midpoint of filing range as the expected offer price. However, the bidding result of institutional investors after the road show is publicly disclosed, including the price of their willingness-to-pay when subscribing for IPO shares. We therefore use the consensus bidding price from institutional investors as the expected offer price.

different subsamples, with a somewhat but insignificantly larger ratio for the high analyst coverage IPOs.

Moving on to firm-specific variables, we first include *largest ownership*, measured as the percentage ownership held by the largest owner. Table 2 shows that there are no significant differences among the three subsamples for this variable. We then consider ownership type. Both state- and privately controlled firms are listed in China. We therefore create the dummy variable *private firm*, which equals one if the IPO firm is ultimately controlled by individuals and zero otherwise. As seen in Table 2, the low analyst coverage subsample includes a higher proportion of privately controlled firms than the other two subsamples and the difference between the low and high coverage subsamples is significant at the 1% level. In addition to these ownership variables, we include a set of control variables commonly found in the IPO literature: *log(firm age)*, measured as the natural logarithm of the firm age in the IPO year; *firm leverage*, measured as the average ratio of the total liabilities to total assets during the three years prior to the IPO; *firm size*, measured as the average value of the natural logarithm of total assets during the three years prior to the IPO; *profitability*, measured as the average ratio of return on equity during the three years prior to the IPO. The summary statistics and tests for differences in Table 2 show that they are all positively related to analyst coverage.

We also include *media coverage* because journalists have an incentive to cover stocks that they believe will attract readers.¹¹ Here, we define media coverage as the number of news reports about the firm in question. This data is manually collected from the China Core Newspapers Full-text Database (CCND), which includes over 1000 Chinese newspapers. We identify whether and how many pieces of news were reported about the IPO firm during the period from the prospectus issuing date to the day prior to trading in the stock. In our sample, the mean media coverage is 4.68, with the median value of 4. Although the number of news reports increases with IPO initial return, there is no significant difference between the subsamples with high and low media coverage.

Finally, we consider the possible role that type of stock exchange can play for post-IPO return performance. The Chinese government launched the Small and Medium Enterprise Board in 2004 and ChiNext in 2009 to provide opportunities for companies with small-to-medium capitalization to go public. We therefore create two dummies to control for these alternative listing locations. *Small and Median Board* equals one if a firm is listed on the Small- and Medium Enterprise Board and zero otherwise. Correspondingly, *ChiNext* equals one if it trades on the ChiNext stock market and zero otherwise.

Summing up, the preliminary evidence in this section suggests that both IPO initial return and post-IPO long-run performance are related to analyst coverage in the

¹¹ For more details on media coverage and IPOs, see Liu et al. (2008).

new issue market. However, the relationship needs to be analyzed further as several of the variables in this section including reputable underwriter, big4, and log(firm size) are also likely to be related to analyst coverage.

[TABLE 2]

4 Empirical Results

4.1 IPO Initial Returns

Typically, we would expect more analyst coverage in the new issue market to be negatively related to IPO initial returns. This expectation is based on the argument that information asymmetry is positively related to underpricing (Baron, 1982; Rock, 1986; Welch, 1989; Ljungqvist, 2005). However, this line of reasoning builds on the premise that analyst reports add value by providing reliable new information to investors. If investors doubt that analysts provide reliable information, then more analyst coverage will have a considerably smaller effect in terms of reducing underpricing by decreasing information asymmetry. As discussed earlier, instead of primarily affecting the market by providing valuable information, more analyst coverage can also affect stock prices by attracting the attention of investors. An increase in investor attention may in turn drive the initial return after an IPO. If this effect dominates the effect of the decrease in information asymmetry, then the initial return will be positively related with analyst coverage. To investigate this, we first

present figures illustrating the relationship between analyst coverage and initial returns, followed by a series of multivariate regressions.

Figure 1 shows a pattern of the relationship between analyst coverage and initial returns that is consistent with the investor attention hypothesis. As more analysts cover a firm, its IPO initial return increases accordingly. Moreover, the figure shows that the relationship between the two is non-monotonic in nature. For example, the average initial return is lower when 1 to 9 analysts cover the firm, compared to when 10 to 15 analysts cover it. On the other hand, a coverage of 16 to 21 analysts is associated with a higher mean initial return compared to when 22 to 24 analysts cover a firm. Figure 1 thus provides initial evidence in favor of the investor attention hypothesis, but it also shows that the association between analyst coverage and IPO initial return is not strictly monotonic.

[FIGURE 1]

To carry out a more comprehensive analysis, we estimate the effects of analyst coverage on IPO initial returns using the following regression specification:

$$IPO_ret_i = \alpha + \beta coverage_i + X_i' \gamma + \delta_{ind} + \zeta_i + \varepsilon_i \quad (1)$$

where IPO_ret_i is the initial IPO return and $coverage_i$ is analyst coverage for firm i . X_i' is a vector of the controls discussed in Section 4.3: market return, reputable underwriter, big4, price revision, offer ratio, largest ownership, private firm, firm age,

firm leverage, firm size, profitability, media coverage, and dummies for the two alternative boards. The specification also includes fixed effects for years (δ_t) and industry (δ_{ind}). All continuous variables are winsorized at the top and bottom 1%. We estimate OLS regressions using heteroskedasticity-robust standard errors clustered by year (Petersen, 2009; Thompson, 2011) because IPOs are often clustered in time, which may result in their initial returns not being independent. We also adjust standard errors by clustering by industry, as there is a possibility that analysts may be more interested in certain industries in general, thereby deciding to cover IPOs in those industries more.

As discussed earlier, analyst coverage affects IPO price pattern in two different ways simultaneously. It can produce new material information and thus reduce information asymmetry. This is called the *information production effect*.¹² Analyst coverage can also draw investor attention to the stock, thereby inflating IPO demand. This is called the *investor attention effect*. We argue that if the *information production effect* dominates, β should be negative because reduced information asymmetry leads to less underpricing. On the other hand, if the *investor attention effect* dominates, β should be positive since an inflated demand leads to a higher

¹² Of course, analysts also disseminate existing information to a broad set of investors (Merton, 1987; Shiller, 2000), which is something that occurs even when they do not produce any new material information. This pure information dissemination process is related to the investor attention effect since more attention grabbing is a prerequisite for increasing the pool of investors. Thus, we use *information production effect* in a narrow sense, referring to a process in which new information is produced.

post-IPO trading price and thus greater initial returns.

The regression results are presented in Table 3. We find that analyst coverage is positively associated with increased IPO initial return at a statistically significant (1%) level. A one standard deviation increase in the number of analyst coverage is associated with a 31% (5.309×0.059) increase in the IPO initial return. The effect is thus substantial and economically significant. This result corroborates the initial univariate result that showed a positive relationship between analyst coverage and IPO initial return. This finding suggests that individual investors in China appear to trade in response to the occurrence of analyst coverage in the new issue market, regardless of the informativeness of that coverage.

Looking at the control variables, Table 3 shows that the coefficient of market return (during the periods between offering and listing) is positive, suggesting that market run ups increase IPO initial returns. Price revision is positively correlated with IPO initial return, but it is only significant at the 10% level. This positive coefficient is consistent with the partial adjustment phenomenon reported in Hanley (1993). The more favorable information is extracted in the book-building process, the higher the IPO offer price and the first-day return. As expected, firm leverage is negatively associated with the initial return as a highly leveraged firm is typically regarded as a risky investment. On the other hand, firm size is negatively associated with the initial return, which is consistent with findings in previous studies (e.g. Hanley, 1993; Ritter, 1987). A plausible reason for this is that large stocks suffer less information

asymmetry and thus tend to yield smaller initial returns. Finally, profitability is negatively associated with the initial return. This is also expected as higher profitability implies lower risk.

[TABLE 3]

4.2 *Post-IPO Returns*

If investor attention influences the initial post-IPO return as our findings in the previous section suggest, one would expect that stock prices will revert once the price pressure induced by investor attention begin to diminish. We therefore argue that if analyst coverage in the new issue market does not reduce information asymmetry surrounding IPOs but instead primarily attract the attention of investors, then analyst coverage should be negatively correlated with long-run IPO performance. If, however, it is the theory of deliberate underpricing that is the main reason behind IPO initial returns, we should not find a systematic relationship between analyst coverage and aftermarket returns.

Following Barber and Lyon (1997) and Lyon et al. (1999), we measure post-IPO performance as buy-and-hold abnormal returns (BHARs) rather than cumulative abnormal returns (CARs) because BHARs yields well-specified test statistics for the long-run behavior of stock returns. Since we focus on investor attention induced by analyst coverage, a one-year event window is long enough for the purpose of this

study.¹³ To avoid extreme short-term movements after an IPO, we set the starting point at one week after the first trading week. Using the standard average of 252 trading days in a year, the event window in this study is thus set to $[+5, +256]$, where 0 is the first trading day.

For completeness, we use several different benchmarks to calculate the post-IPO BHARs. The first benchmark is an equally-weighted index of market returns for all A-share firms. The second benchmark is a tradable value-weighted index of market returns for all A-share firms. The third benchmark is a tradable value-weighted portfolios based on firm size and the book-to-market ratio. The matching portfolio for each stock is created as follows. First, we divide all seasoned firms into five size groups for each quarter and record quarterly size breakpoints. Similarly, we independently divide them into five book-to-market groups each quarter with an equal number of firms in each group. Then, 25 portfolios are formed by intersecting the size and book-to-market quintiles. This procedure is repeated for January, April, July and October of each year and then each IPO is matched to its corresponding benchmark portfolio. For each IPO, firm size is calculated using the market capitalization on the first trading day. The book-to-market ratio is calculated using the first recorded post-issue book value and the post-issue market capitalization is computed using the closing market price on the first trading day. We thus create a separate benchmark for

¹³ Using two- or three-year BHARs or CARs instead does not change our findings.

each IPO, thereby taking the time-varying firm risk characteristics of each IPO and matching portfolio into consideration.

Having calculated the BHARs using the three different benchmarks, we are now ready to perform the analysis. We estimate the effects of analyst coverage on post IPO performance using the same regression specification as in Equation (1), this time with the three different BHARs as the dependent variable. Table 4 reports the results of the multivariate regressions. Columns 1-3 in Table 4 show that, other things being equal, the number of analyst coverage is negatively associated with aftermarket returns in excess of the equally weighted index, the tradable value weighted index, and the matching portfolio. The coefficients for analyst coverage are significant in both statistical and economic terms. For example, a one-standard deviation increase in the number of analysts covering a stock is associated with an 8% (5.309×-0.015) lower post-IPO one-year return in excess of the equally weighted index. Looking at the control variables, we note that the coefficient for reputable underwriter is significant and positive. This implies that a reputable underwriter improves IPO long-run performance, a finding that is consistent with Michaely and Shaw (1994) and Carter et al. (1998). Finally, price revision is negatively correlated with post-IPO BHARs, but it is only significant in two of the three regression specifications.

Taken together, the positive association between analyst coverage and IPO initial returns and the negative association between analyst coverage and long-run aftermarket returns are consistent with the investor attention hypothesis put forward in

this study. The findings suggest that investor attention induced by analyst coverage makes early after-market prices deviate from prices that would be based on the fundamental value of the firms.

[TABLE 4]

To shed further light on the investor attention argument, we now focus on IPO firms with higher initial returns. We split these firms into two groups based on the median value of analyst coverage. If investor attention drives the initial return, then one can expect that IPOs characterized by higher initial returns and more analyst coverage will experience greater post-issuance return reversal. Figure 2 illustrates the main findings, with Panel A showing the return in excess of equally weighted all A-share stocks index, Panel B presenting the return in excess of tradable value weighted all A-share stocks index, and Panel C showing the return in excess of the matching portfolios. Since the main results do not essentially change when using different benchmarks, we only discuss panel C for brevity. The BHARs for IPO portfolios with higher first-day returns and less analyst coverage is -15% on average, while the corresponding value for IPO portfolios with higher first-day returns and more analyst coverage is -24%, The difference between the two average BHARs is 9% and this difference is statistically significant at the 1% level. The median value of BHARs paints a similar picture, with an even larger (14%) difference that is statistically significant at the 1% level. Figure 2 thus shows that IPOs with higher initial returns

driven by more investor attention reverse more aggressively than similar IPOs characterized by less analyst coverage.

[FIGURE 2]

To control for other factors that may influence these relationships, we run the same multivariate regression as above, this time including the initial return and an interaction variable for analyst coverage and the initial return. The results for each of the three new model specifications are presented in Table 5. Analyst coverage still has a negative effect on post-IPO long-run performance. The results are similar across the three model specifications, but the statistical significance is somewhat weaker for model 1. The coefficient for the interaction variable for analyst coverage and IPO initial returns is significant and negative at the 5% level for return in excess of an equally-weighted index and return in excess of a tradable value-weighted index, and at the 1% level for the return in excess of size and B/M matching portfolios. For IPOs characterized by higher initial returns as well as more analyst coverage, the higher initial returns are thus partly a result of price pressure driven by investor attention and will revert in the long run.

To sum up, the findings in Table 4 and 5 show that long-run poor performance of IPOs covered by more analysts is consistent with the hypothesis that investor attention initially pushes early aftermarket prices above fundamental values even after

controlling for the typical factors that have been related to aftermarket returns in previous research.

[TABLE 5]

4.3 *Small Trading Activities*

In the previous section, our results suggested that analysts in China grab the attention of investors rather than producing new material information on the firms they cover. This finding supports the theoretical work by Derrien (2005) and Ljungqvist et al. (2006), which imply that it is individual investors who temporarily push aftermarket prices of IPO stocks above their fundamental level. Consequently, one would expect individual investor trading to be positively correlated with analyst coverage if it indeed draws them into the market when IPO stocks begin to trade publicly.

To examine this empirically, we need to find a proxy for trading by individual investors. We first assume that small trades are more likely to be driven by individual investors. The buying behavior of individual investors on the first trading day is easily identified due to the unique “T+1 trading rule” which prevents investors from selling stocks bought on the same day. We use the modified version of the Lee and Ready (1991) algorithm developed by Odders and White (2000) to classify trades as being buyer- or seller-initiated. If a trade is executed at a price above (below) the midpoint of the most recent bid ask spread, it is classified as buyer (seller) initiated; if a trade occurs exactly at the midpoint of the most recent bid ask spread, we designate it using

the previous transaction price according to the “tick test”. That is, a trade is identified as buyer (seller) initiated if the trade price is above (below) the most recently executed trade price. After each transaction is designated as buyer- or seller-initiated and as small trade or large trade, respectively, we construct different proxies for buyer-initiated small trading activities.

Following previous studies which assume that small trades are executed by noise traders while large trades are executed by sophisticated investors, two methods can be used to identify small trades: the dollar value of shares traded and the number of shares traded. Looking first at the dollar value approach, we compute the following for the first trading day of each IPO:

$$OIB_Dol = (Buy_Dol_{i,t} - Sell_Dol_{i,t}) / (Buy_Dol_{i,t} + Sell_Dol_{i,t}) \quad (2)$$

where OIB_Dol is the order imbalance measured in dollars, and $Buy_Dol_{i,t}$ and $Sell_Dol_{i,t}$ are the dollar value of small trades of stock i bought and sold on day t .

Lee and Radhakrishna (2000) allows for a buffer zone (\$20,000-\$50,000) between small and large trades because institutional investors may split their trades to hide private information. Barclay and Warner (1993) and Chakravarty (2001) find that institutional stealth trading mainly occurs in medium size trades. Thus, eliminating medium-sized trades alleviate the concern for misclassification. According to prevailing practices in China’s financial industry, we define trades that involve less than RMB 50,000 as small trades, and trades for sums larger than RMB 500,000 as

large trades in this study. Next, we also take a look at size in terms of number of shares:

$$OIB_Num = (Buy_Num_{i,t} - Sell_Num_{i,t}) / (Buy_Num_{i,t} + Sell_Num_{i,t}) \quad (3)$$

Here, OIB_Num is the order balance measured in shares, and $Buy_Num_{i,t}$ and $Sell_Num_{i,t}$ is the share number of small trades of stock i bought and sold on day t . For the purpose of this analysis, we define a small trade as one that involves less than 1,000 shares. Lee and Radhakrishna (2000) argue that dollar- rather than share-based cutoffs better separates individual traders from institutional traders because the former is less sensitive to stock price changes. For completeness, we still report the results using both approaches.

In addition to the order imbalance measures, we also compute two alternative measures of trading activity: $Ln(N_Small)$, the number of small trades, which is defined as the natural logarithm of the number of buyer-initiated small trades on the first trading day, where a small trade is defined as a trade involving less than RMB 50,000; $Ln(ATS)$, the mean trade size, which is defined as the natural logarithm of the average buyer-initiated trade size on the first trading day.

Panel A in Table 6 presents descriptive statistics for the four different measures of trading activity. We find that small trading buying activities is more intense than selling activities, regardless of whether we measure the order imbalance in shares or in dollars. Panel B reports correlations between the four measures for small trading

activities. *OIB_Num* is significantly and negatively related with *Ln(ATS)* at the 1% level. *Ln(N_Small)* is positively connected with *OIB_Dol* at 5% level when we use the Spearman rank correlation coefficient.

Panel C presents the multivariate regression of analyst coverage on small trading activities. Order imbalance during the initial trading day, regardless of whether it is measured in shares or dollars, is significantly and positively correlated with the number of analyst coverage in the new issue market. That is, order imbalance increases with analyst coverage, suggesting an excess buying pressure from individual investors. In column 3, analyst coverage is positively related with *Ln(N_Small)*, suggesting that when more analyst covers a firm, more buyer-initiated small trades take place. Finally, column 4 illustrates that the average trade size is negatively associated with pre-trading analyst coverage. Because intensive retail trading should be associated with a smaller *Ln(ATS)*, this suggests that when a greater number of analysts cover an IPO firm, more individual investors are likely to invest during the first day of trading. These results support the argument that individual investor trading dominates IPO initial trading.

[TABLE 6]

5 Robustness Checks

5.1 Instrument Variable Analysis

It could be argued that the strong relationships between analyst coverage and IPO initial returns and one-year post-IPO BHARs in the previous section might be spurious in nature. That is, it could be that IPO performance and analyst coverage may not be exogenous due to omitted variables. For example, analysts endogenously may choose to cover an IPO firm with a high intrinsic quality that may not be observable, and that same unobservable firm characteristic may also affect IPO performance. To control for this endogeneity problem, we run two-stage least squares (2SLS) regressions.

The instruments for the endogenous variables in the analysis include: *Industry median number of analysts*, measured as the median number of analysts in industry j that firm i belongs to in year t ; *industry leader*, an indicator for whether the firm is an industry leader, measured as whether its sales ranked among the top 30% in its industry in year t ; *segments*, measured as the number of segments, including only those whose sales exceeds 30% of firm i 's total sales in year t .¹⁴ In order to capture the variations in analyst coverage that are exogenous to the initial return, statistical

¹⁴ The underlying rationale for including these instruments is found in previous studies on determinants of analyst coverage, including Bushman et al. (2003), Lang and Lundholm (1993), Healy et al. (1999), Francis et al. (1997), and Bhushan (1989).

tests on the relevance (correlated with the endogenous variables) and validity (orthogonal to the residuals or exogenous with the dependent variable) are also provided.

Panel A in Table 7 provides summary statistics for the instrument variables. The mean value of analyst coverage is 8.9, with its corresponding median value of 9. The mean of the variable industry leader is 0.139, suggesting that about 13.9% of IPOs in the sample is a leader in its industry. Finally, the average of segments is 1.095, indicating that most IPOs only have one business sector.

Column 1 in Panel B reports the results of the first-stage regression of the 2SLS specification. The coefficients for industry median number of analysts and industry leader are both statistically significant and positive in the first stage, suggesting that these are important determinants for analyst coverage. Segments also seems to play a role, although it is only statistically significant at the 10% level. These results suggest that the instruments are relevant. The next column in Panel B presents the second-stage regressions, with the predicted value of analyst coverage as the independent variable. The coefficient estimates of predicted coverage are positive and statistically significant at the 5% level, supporting the hypothesis that analyst coverage grabs the attention of investors.

Diagnostics on the instrumental variables are presented in the bottom lines of the table. The Shea (1997) partial R^2 values and the F -statistic support the joint relevance of all first-stage instruments, thus rejecting the null hypothesis that the

instruments are weak. We also report the Hansen-Sargan test is also reported because of over-identifying restrictions with more instruments than endogenous variables. We cannot reject the null hypothesis that the instruments are satisfying the orthogonality conditions that are required for us to use them. Finally, the Hausman test rejects the exogeneity of analyst coverage.

Panel C in Table 7 presents the results of the instrumental variable analysis with post-IPO one-year BHARs as the dependent variable in the second-stage specification. Predicted coverage is negatively and significantly related with the different measures of BHARs, indicating that an increase in analyst coverage may lead to greater deterioration in IPO long-run performance. The coefficient for the interaction term between IPO initial return and predicted coverage is significant and negative, implying that IPOs characterized by large initial returns and more analyst coverage will experience greater post-issuance return reversals. The partial F-Statistics, the Shea (1997) partial R^2 , and the Sargan-J and Hausman tests again support the validity of the instruments.

[TABLE 7]

5.2 Alternative Explanation Based on Investor Sentiment

Although Barber and Odean's (2008) attention-induced price pressure hypothesis explains the findings in Section 4, the higher IPO initial return and the subsequent long-run underperformance can also be explained by arguments based on investor sentiment as seen in Ljungqvist et al. (2006) and Cook et al. (2006). For

example, investor sentiment can push the aftermarket price, resulting in a positive first-day returns on average. As investor exuberance fades over time, stock returns eventually revert back. Analyst coverage may thus be driven by expected over-enthusiasm of individual investors. While this alternative story fits the results, we would also expect additional effects that are not explained by our hypothesis. This is because aggregate investor sentiment rises and subsides in waves (eg. Kumar and Lee, 2006; Baker and Wurgler, 2006) and the impact of investor sentiment is particularly acute during bull markets such during the internet bubble in the late 1990s (e.g. Cook et al., 2003; Ljungqvist et al., 2006).

Thus, to shed light on the explanatory power of this alternative hypothesis, we first divide the sample into groups based on whether the IPOs took place during bull market or non-bull markets. If the investor sentiment argument dominates the results, we would expect the relationship between analyst coverage and IPO performance to be more prominent during bull-market periods (Ljungqvist et al., 2006). In this study, a bull-market period is defined as a year in which the return on the tradable value-weighted all A share index exceeds 100%. For our sample, this happened in 2006, 2007, and 2009. Correspondingly, non-bull market periods took place in 2008, 2010, 2011, and 2012. The regression results for the two subsamples are reported in Table 8. In Panel A, we find that the relationship between the number of analyst coverage and IPO initial return is still significant during non-bull market periods. Unreported statistical tests cannot reject the null hypothesis of no difference in coefficients on

analyst coverage between the bull and non-bull period subsamples. Panel B in Table 8 shows the post-IPO one-year BHARs. Again, we cannot find a significant difference between the two samples. The analyst coverage still significantly influences IPO long-term performance during periods with low aggregate sentiment.

These results are strengthened by the fact that the sample actually includes a major speculative bubble. Starting at about 1,600, the Shanghai Composite Index rose quickly and reached a peak of more than 6,100 in October 2007. After this peak, the market collapsed to 1,800 in November 2008, after which it fluctuated around 2,300. Thus, periods of boom and bust can be partitioned by October 2007. We use this ideal setting to check the investor sentiment argument again and find that the results still hold in the second time period, which was characterized by a bear market. We do not report these regression results for brevity. While the alternative investor attention argument cannot be fully ruled out, our findings in this section suggest that the investor attention hypothesis is a more consistent explanation of the initial results in Section 4.

[TABLE 8]

Although sentiment is often seen as a market-wide phenomenon (eg. Baker and Wurgler, 2006), it may be argued that the firm-specific sentiment for IPO firms may differ. To better substantiate the argument that attention is driving underpricing, we should therefore control for this as well. Using 62 French IPOs, Derrien (2005) find that investor sentiment is positively associated with IPO first-day return. He

argues that the oversubscription rate is a good proxy for the firm-specific sentiment. As in France, a modified book-building process is used in China, in which a fraction of IPO shares is reserved for individual investors. The oversubscription rate for individual investors in the primary market is also publicly announced in China. We therefore take the oversubscription rate divided by 100 and use it as a proxy for IPO-specific investor sentiment. We can then analyze the significance of analyst coverage after controlling for investor sentiment. The results of the new regressions in which we include the oversubscription rate are presented in Table 9. Before discussing the findings, it is worthwhile to address that the correlation between analyst coverage and oversubscription rate is 0.255 and significant at the 1% level, suggesting that they are closely related. This is not surprising as attention is a prerequisite for generating sentiment and individual investors are more likely to be sentiment traders and thus prone to various biases driven by reasons such as attention (Da et al., 2011).

Panel A in Table 9 reports the results of the multivariate regressions with the initial return after the IPO as the dependent variable. In Column 1, we again provide the results from Panel A of Table 3. In Column 2, we present the results from the regression in which we replace analyst coverage with the oversubscription rate as the main explanatory variable. Its coefficient is statistically significant and positive, implying that firm-specific investor sentiment is strongly related to the initial return. This result corroborates the findings in earlier studies, including Ritter and Welch (2002) and Cornelli et al. (2006). A one standard deviation increase in the

oversubscription rate is associated with an 11% (7.86×0.014) increase in the IPO first-day return.

In a third model specification, we include both analyst coverage and the oversubscription rate as explanatory variables, thereby basically running a horse race to see which variable has the greater explanatory power. The regression results for this specification are presented in Column 3. The coefficient for analyst coverage remains positive and statistically significant at the 1% level. While the coefficient for the oversubscription rate is still positive, it is no longer statistically significant. These findings suggest that investor attention has a greater explanatory power for the initial return than investor sentiment. This finding is intuitive as individual investors are able to generate some form of sentiment only after they pay attention to the stock.

Finally, Panel B in Table 9 presents the regression results when we analyze investor attention and investor sentiment and their relationship with post-IPO long-run stock performance. Although both oversubscription rate and its interaction with IPO initial return are negatively correlated with one-year IPO BHARs in Column 2, both coefficients turn out to be insignificant. This means that the investor sentiment argument cannot fully explain the results in Section 4. In Column 3, we again include both analyst coverage and the oversubscription rate. Consistent with the investor attention hypothesis, the coefficients for analyst coverage and its interaction with IPO initial return are still significant and negative. However, the corresponding coefficients for oversubscription rate and its interaction with the initial return are once

more insignificant. We can therefore conclude that it is investor attention rather than investor sentiment that drives the stock price above the fundamental value price level during the first day of trading.

[TABLE 9]

6 Conclusion

We propose a new hypothesis based on bounded rationality that helps explain underpricing. We suggest that underpricing is a result of unusual attention given to an IPO by investors. To support this claim with empirical evidence, we use analyst coverage in the new issue market as a proxy for investor attention. We find that the more analysts cover a firm prior to going public in China, the higher the firm's stock return during the first day of trading.

Chinese analysts often issue reports on a firm before it goes public, a phenomenon that is not commonly found in the U.S. By exploiting this feature, we are able to shed new light on the hypothesis that analyst coverage can reduce information asymmetry and thus improve the efficiency of price formation in financial market. Contrary to what is expected based on this information production hypothesis, we find that the analyst coverage is positively related with the initial return after the IPO. This finding is inconsistent with the argument of deliberate underpricing found in previous studies (e.g. Rock 1986; Benveniste and Spindt, 1989). Taking the generally low quality of analyst reports in China into account, we argue that frequent issuance of analyst reports may not provide new material information about IPO firms, but instead

primarily help attract the attention of individual investors. If this assumption holds, then price pressure induced by investor attention will drive the price up temporarily, resulting in high initial returns. Overpriced IPOs will eventually revert to their fundamental value, resulting in a relatively poor long-run stock return. Our analysis on a sample of Chinese IPOs during the period 2006-2012 provides strong evidence in favor of the investor attention hypothesis. We also show that endogeneity is not driving these results and that an alternative investor sentiment argument does not change our findings.

Even though the empirical analysis that provides evidence in support of the investor attention hypothesis in this study is based on Chinese data, the implications of our findings can be generalized to other countries. Cook et al. (2006) argue that investment bankers have incentives to encourage individual investors to be active in the IPO market and do so by different forms of marketing which results in a higher visibility of IPO firms. Supporting this, Merton (1987) argues that investors will buy stocks that they are aware of. In addition to traditional marketing activities, general media exposure is a way to attract investor attention. Several studies have highlighted how media reports are related with stock trading activities of individual investors (Shiller, 2000; Huberman and Regev, 2001; Tetlock, 2007; Barber and Odean, 2009; Fang and Peress, 2009; Tetlock, 2011). Following this line of argument, Liu et al. (2014) discuss long-term effects of pre-IPO media coverage. Our findings combined with the contributions in these earlier studies suggest that that different ways of

attracting the attention of individual investors can have significant effects on stock prices in connection to IPOs.

The findings in this study also shed new light on the policy debate on IPO “quiet period” rules in U.S. The main premise behind the quiet period rules is that investors should make investment decisions based on the careful disclosures contained in the prospectus, rather than on information produced by the company or related parties which is not reviewed by the SEC because the attention of minority investors would stray from the information contained in the prospectus to other “glossier” documents if given the opportunity (Heyman, 2013). This rule thus serves to protect investors against false or misleading statements. During the last decade, numerous IPO firms have been criticized for engaging in communication that has been controversial during their IPO registration process. The SEC has also investigated numerous complaints stating that analysts affiliated with investment banks that underwrite IPOs have given preferred clients early access to their reports on IPO firms’ future prospects. The concern here is thus that favorable information disseminated by issuers and related parties may have influenced investors asymmetrically. The findings in this study illustrate that the IPO process indeed can be affected by actions taken by different actors such as analysts and thus suggest that the proposal to relax the quiet period rules in U.S should not be taken lightly.

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Table 1. The Sample***Panel A. Distribution of Sample by Year***

This panel presents the distribution of the sample by year during 2006-2012. Column 2 reports the number of IPOs in a given year. Column 3 and 4 report the mean and median value of analyst coverage in a given year.

Year	Sample	Analyst Coverage	
		Mean	Median
2006	65	14.94	15
2007	123	16.72	16
2008	76	14.51	15
2009	102	18.75	19
2010	347	11.30	11
2011	281	7.89	9
2012	82	8.70	10
Total	1075	11.99	12

Table 1. The Sample (Continued)***Panel B. Distribution of Sample by Industry***

This panel presents the distribution of the sample by industry during 2006-2012.

Industry is classified according to the Guidelines for the Industry Classification of Listed Companies by CSRC (2001 Revision).

Industry	Sample	Analyst Coverage	
		Mean	Median
Agriculture, Forestry, farming & fishery	19	14.32	15
Mining	24	15.29	17
Food & Beverage	33	14.85	14
Textiles & Apparel	29	11.55	11
Timber & Furnishings	7	8.00	6
Paper & Printing	23	11.26	11
Petrochemicals	127	11.06	11
Electronics	96	10.88	11
Metals & Non-metals	83	10.92	11
Machinery	267	10.66	10
Pharmaceuticals	52	13.35	14
Other manufacturing	17	12.41	13
Utilities	7	13.43	15
Construction	29	13.45	12
Transportation	22	16.45	17
Information Technology	128	11.74	11
Whole sale & Retail Trade	30	14.93	14
Finance	21	17.90	17
Real estate	8	16.00	16
Social Services	33	13.28	13
Communication & Culture	18	13.33	12
Conglomerate	2	13.00	13
Total	1075	11.99	12

Table 2. Summary Statistics

This table reports the summary statistics for the full sample as well as the subsamples with Low, Medium, and High analyst coverage in the new issue market. The mean of a variable is calculated as the average across all IPO firms and years, and its corresponding median value is presented in parentheses. *Analyst Coverage* is measured as the number of analysts who covered an IPO firm in the new issue market. *IPO initial return* is measured as the percentage change from IPO offer price to the first-day close price. *Return in Excess of Equally Weighted all A-Share Stocks Index*, *Return in Excess of Tradable Value Weighted All A-Share Stocks Index*, *Return in Excess of Size and B/M Matching Portfolios* measure the one-year post-IPO stock performance relative to different benchmarks. *Market Return* is measured as the tradable value weighted return of all A-share stocks in China from the offering date to the first trading date. *Reputable Underwriter* is a dummy variable which equals one if the total amount of IPO share sold or the total number of IPOs the underwriter underwrote during the previous three years is among the top 10% and zero otherwise. *Big4* is a dummy variable which equals one if the auditor is one of the big four international accounting firms (Deloitte, Ernst & Young, KPMG, and PricewaterhouseCoopers) and zero otherwise. *Price Revision* is measured as the percentage change between the finalized offer price and the expected offer price. *Offer Ratio* is measured as the ratio of shares offered in the IPO to total shares. *Largest Ownership* is measured as the percentage ownership held by the largest owner. *Private Firm* is a dummy variable which equals one if the IPO firm is ultimately controlled by individuals and zero otherwise. *Log(Firm Age)* is measured as the natural logarithm of the firm age in the IPO year. *Firm Leverage* is measured as the average ratio of the total liabilities to total assets during the three years prior to the IPO. *Firm Size* is measured as the average value of the natural logarithm of total assets during the three years prior to the IPO. *Profitability* is measured as the average ratio of return on equity during the three years prior to the IPO. *Media Coverage* is the number of media reports about IPO firms. *Small and Median Board* is a dummy variable, which equals one if the IPO firms is listed on the Small- and Medium Enterprise Board and zero otherwise. *ChiNext* is a dummy variable which equals one if it trades on the ChiNext stock market and zero otherwise. All continuous variables are winsorized at top and bottom 1%. Absolute values of T-tests and Wilcoxon-Mann-Whitney tests are provided for the mean and median comparison of the Low Analysts and High Analysts subsamples. ***, **, and * denote significance at the 1%, 5% and 10% level, respectively.

	Full Sample	Low Analysts (1)	Medium Analysts (2)	High Analysts (3)	T-test (W-M-W test) (3)-(1)
Analyst Coverage	11.99 (12.00)	6.40 (6.00)	11.54 (12.00)	17.53 (17.00)	55.80*** (24.09***)
IPO initial return	62.55% (38.79%)	13.62% (10.42%)	56.48% (42.26%)	112.74% (86.69%)	21.70*** (21.35***)

Return in Excess of Equally Weighted	-0.26	-0.12	-0.26	-0.40	7.38***
all A-Share Stocks Index	(-0.19)	(-0.14)	(-0.19)	(-0.25)	(6.72***)
Return in Excess of Tradable Value Weighted	-0.11	-0.08	-0.10	-0.15	2.13**
All A-Share Stocks Index	(-0.11)	(-0.12)	(-0.13)	(-0.08)	(3.55***)
Return in Excess of Size and B/M	-0.06	0.00	-0.04	-0.13	5.38***
Matching Portfolios	(-0.09)	(-0.03)	(-0.07)	(-0.19)	(7.47***)
Market Return	0.34%	-1.07%	0.77%	1.32%	5.90***
	(0.21%)	(-3.49%)	(0.54%)	(1.81%)	(6.74***)
Reputable Underwriter	0.17	0.13	0.17	0.22	3.05***
	(0.00)	(0.00)	(0.00)	(0.00)	(3.03***)
Big 4	0.06	0.02	0.05	0.10	4.68***
	(0.00)	(0.00)	(0.00)	(0.00)	(4.62***)
Price Revision	0.16	0.08	0.15	0.25	6.54***
	(0.00)	(0.00)	(0.00)	(0.00)	(6.36***)
Offer Ratio	0.25	0.24	0.25	0.25	0.04
	(0.25)	(0.25)	(0.25)	(0.25)	(1.34)
Largest Ownership	0.39	0.38	0.39	0.40	1.00
	(0.38)	(0.36)	(0.37)	(0.38)	(0.71)
Private Firm	0.84	0.95	0.86	0.70	9.73***
	(1.00)	(1.00)	(1.00)	(1.00)	(9.18***)
Log(Firm Age)	7.44	6.49	7.61	8.42	5.74***
	(7.00)	(6.00)	(7.00)	(8.00)	(5.76***)
Firm Leverage	0.52	0.50	0.51	0.54	3.47***
	(0.53)	(0.51)	(0.52)	(0.54)	(2.76***)
Log(Firm Size)	20.07	19.90	19.95	20.31	3.92***
	(19.76)	(19.77)	(19.70)	(19.81)	(1.08)
Profitability	0.28	0.26	0.27	0.29	3.13***
	(0.26)	(0.25)	(0.26)	(0.27)	(3.68***)
Media Coverage	4.68	3.92	4.87	5.24	1.35
	(4.00)	(3.00)	(4.00)	(4.00)	(0.48)
Small and Median Board	0.58	0.48	0.59	0.68	5.67***
	(1.00)	(0.00)	(1.00)	(1.00)	(5.56***)
ChiNext	0.30	0.42	0.32	0.18	7.78***
	(0.00)	(0.00)	(0.00)	(0.00)	(7.49***)
Number of Observations	1075	373	302	400	

Table 3. Analyst Coverage and IPO Initial Return

This table presents the result of an OLS regression for the effect of analyst coverage on IPO initial return. *Analyst Coverage* is defined as the number of analysts who covered an IPO firm in the new issue market. Control variables are defined in Table 2. Year, industry and board dummies are included but not reported. All continuous variables are winsorized at the top and bottom 1%. T-statistics are given in parentheses and computed using heteroskedasticity-robust standard errors clustered by industry and year (Petersen, 2009; Thompson, 2011). ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	IPO Initial Return
Analyst Coverage	0.059*** (15.26)
Market Return	1.191*** (4.05)
Reputable Underwriter	0.010 (0.23)
Big 4	0.053 (0.63)
Price Revision	0.089* (1.73)
Offer Ratio	-0.646 (-1.45)
Largest Ownership	0.149 (1.34)
Private Firm	-0.111 (-1.30)
Log(Firm Age)	-0.003 (-0.72)
Firm Leverage	0.236* (1.74)
Log(Firm Size)	-0.173*** (-7.48)
Profitability	-1.076*** (-6.40)
Media Coverage	0.041 (0.13)
Intercept	4.081*** (7.91)
Year indicators	Yes
Industry indicators	Yes
Board indicators	Yes
N	1075
Adjusted R^2	0.359

Table 4. Analyst Coverage and Post-IPO Performance

This table presents OLS regression results of the effect of analyst coverage on one-year post-IPO BHARs, alternatively measured as Return in Excess of Equally Weighted all A-Share Stocks Index, Return in Excess of Tradable Value Weighted All A-Share Stocks Index, and Return in Excess of Size and B/M Matching Portfolios. *Analyst Coverage* is defined as the number of analysts who covered an IPO firm in the new issue market. The control variables are defined in Table 2. Year, industry and board dummies are included but not reported. All continuous variables are winsorized at the top and bottom 1%. T-statistics are given in parentheses and computed using heteroskedasticity-robust standard errors clustered by industry and year (Petersen, 2009; Thompson, 2011). ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	(1) Return in Excess of Equally Weighted all A-Share Stocks Index	(2) Return in Excess of Tradable Value Weighted All A-Share Stocks Index	(3) Return in Excess of Size and B/M Matching Portfolios
Analyst Coverage	-0.015*** (-3.32)	-0.012*** (-3.04)	-0.012*** (-3.34)
Reputable Underwriter	0.092*** (2.66)	0.055* (1.73)	0.063** (2.18)
Big 4	-0.016 (-0.23)	-0.020 (-0.31)	-0.009 (-0.16)
Price Revision	-0.001 (-0.02)	-0.143*** (-3.02)	-0.098** (-2.29)
Offer Ratio	-0.171 (-0.47)	-0.141 (-0.42)	0.114 (0.38)
Largest Ownership	-0.010 (-0.11)	-0.027 (-0.33)	0.003 (0.04)
Private Firm	0.021 (0.49)	0.003 (0.08)	0.008 (0.23)
Log(Firm Age)	0.001 (0.37)	0.001 (0.28)	0.001 (0.56)
Firm Leverage	0.021 (0.19)	-0.007 (-0.06)	-0.011 (-0.12)
Log(Firm Size)	-0.027 (-1.29)	-0.024 (-1.22)	-0.010 (-0.58)
Profitability	0.010 (0.07)	0.064 (0.51)	0.131 (1.15)
Media Coverage	0.002 (0.46)	-0.004 (-0.31)	0.015 (0.57)
Intercept	0.470 (0.96)	0.598 (1.32)	0.226 (0.55)
Year indicators	Yes	Yes	Yes
Industry indicators	Yes	Yes	Yes
Board indicators	Yes	Yes	Yes
Number	1075	1075	1075
Adjusted R^2	0.310	0.356	0.143

Table 5. The Effect of Analyst Coverage and its Interaction with IPO Initial Return on Post-IPO BHARs

This table presents the effect of analyst coverage and its interaction with IPO initial return on post-IPO BHARs. *Analyst Coverage* is defined as the number of analysts who covered an IPO firm in the new issue market. Control variables are defined in Table 2. Year, industry and board dummies are included but not reported. All continuous variables are winsorized at the top and bottom 1%. T-statistics are given in parentheses and computed using heteroskedasticity-robust standard errors clustered by industry and year (Petersen, 2009; Thompson, 2011). ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	(1) Return in Excess of Equally Weighted All A-Share Stocks Index	(2) Return in Excess of Tradable Value Weighted All A-Share Stocks Index	(3) Return in Excess of Size and B/M Matching Portfolios
Analyst Coverage	-0.005** (-2.25)	-0.008*** (-2.71)	-0.006*** (-2.93)
Analyst Coverage*	-0.005**	-0.004**	-0.004***
First-Day Return	(-2.02)	(-2.34)	(-3.22)
First-Day Return	-0.068 (-0.90)	-0.086 (-0.86)	-0.065 (-1.29)
Reputable Underwriter	0.092*** (2.68)	0.056* (1.77)	0.063** (2.21)
Big 4	-0.013 (-0.19)	-0.020 (-0.31)	-0.010 (-0.18)
Price Revision	-0.004 (-0.08)	-0.140*** (-2.95)	-0.095** (-2.20)
Offer Ratio	-0.162 (-0.45)	-0.211 (-0.63)	0.049 (0.16)
Largest Ownership	-0.004 (-0.04)	-0.018 (-0.22)	0.010 (0.14)
Private Firm	0.018 (0.41)	-0.006 (-0.16)	0.000 (-0.00)
Log(Firm Age)	0.001 (0.27)	0.000 (0.16)	0.001 (0.46)
Firm Leverage	0.039 (0.35)	0.014 (0.14)	0.004 (0.05)
Log(Firm Size)	-0.034 (-1.54)	-0.042** (-2.08)	-0.026 (-1.40)
Profitability	-0.014 (-0.10)	-0.027 (-0.21)	0.052 (0.45)
Media Coverage	-0.007 (-0.29)	-0.008 (-0.52)	0.003 (0.45)
Intercept	0.643 (1.26)	1.030*** (2.20)	0.587 (1.38)
Year indicators	Yes	Yes	Yes
Industry indicators	Yes	Yes	Yes
Board indicators	Yes	Yes	Yes
Number	1075	1075	1075
Adjusted R^2	0.390	0.303	0.142

Table 6. Analysis of Small Trading Activities

This table analyze the small trading activities in IPO first trading day, alternatively measured as OIB_Num , OIB_Dol , $Ln(N_Small)$ and $Ln(ATS)$. Here, OIB_Num is order imbalance measured in share numbers, defined as $OIB_Num = (Buys_Num_{i,t} - Sells_Num_{i,t}) / (Buys_Num_{i,t} + Sells_Num_{i,t})$, where $Buys_Num_{i,t}$ and $Sells_Num_{i,t}$ are the share number of small trades of stock i bought and sold, respectively, on day t , and small trading in shares is defined as trading shares blow 1,000. OIB_Dol is order imbalance measured in dollars, defined as $OIB_Dol = (Buys_Dol_{i,t} - Sells_Dol_{i,t}) / (Buys_Dol_{i,t} + Sells_Dol_{i,t})$, where $Buys_Dol_{i,t}$ and $Sells_Dol_{i,t}$ are the dollar value of small trades of stock i bought and sold, respectively, on day t , and small trading in value is defined as trading value blow RMB 50,000. $Ln(N_Small)$ is measured as the natural logarithm of the number of small buyer-initiated trades during the first day of trading, where small trade is defined as the trading value which is below 50,000 RMB. $Ln(ATS)$ is measured as the natural logarithm of the average buyer-initiated trade size during the first day of trading. All continuous variables are winsorized at the top and bottom 1%.

Panel A: Summary statistics

	N	Mean	Median	Standard Deviation
OIB_Num	705	2.243	0.065	7.430
OIB_Dol	705	0.273	0.249	0.119
$Ln(N_Small)$	705	10.805	10.754	0.753
$Ln(ATS)$	705	9.288	9.246	0.451

Panel B: Correlations

This panel presents the correlation matrix of the variables for small trading activities. The upper triangle presents the Pearson correlation coefficient and the lower triangle presents the Spearman correlation coefficient. ***, **, and * denote significance at the 1%, 5% and 10% level, respectively.

	OIB_Num	OIB_Dol	$Ln(N_Small)$	$Ln(ATS)$
OIB_Num	1.000	0.031	-0.022	-0.172***
OIB_Dol	0.003	1.000	0.008	0.057
$Ln(N_Small)$	0.001	0.112**	1.000	0.046
$Ln(ATS)$	-0.213***	-0.207	-0.230	1.000

Table 6. Analysis of Small Trading Activities (Continued)**Panel C: Multivariate Regression**

This panel present the OLS regression of analyst coverage on the small trading activities, alternatively measured as *OIB_Num*, *OIB_Dol*, *Ln(N_Small)* and *Ln(ATS)*.

Analyst Coverage is defined as the number of analysts which covered an IPO firm in the new issue market. Control variables are defined in Table 2. Year, industry and board dummies are included but not reported. T-statistics are given in parentheses and computed using heteroskedasticity-robust standard errors clustered by industry and year (Petersen, 2009; Thompson, 2011). ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	(1) <i>OIB_Num</i>	(2) <i>OIB_Dol</i>	(3) <i>Ln(N_Small)</i>	(4) <i>Ln(ATS)</i>
Analyst Coverage	0.266*** (2.78)	0.003** (2.55)	0.052*** (9.76)	-0.014*** (-3.48)
Reputable Underwriter	0.007 (0.41)	0.019 (1.39)	0.087* (1.76)	-0.017 (-0.46)
Big 4	2.301 (1.12)	0.011 (0.36)	-0.046 (-0.43)	0.031 (0.39)
Price Revision	0.022 (0.02)	0.035* (1.81)	0.428*** (3.74)	-0.068 (-0.80)
Offer Ratio	11.913 (1.09)	-0.002 (-0.24)	1.193** (2.16)	0.654 (1.60)
Largest Ownership	-3.246 (-1.33)	0.013 (0.37)	0.120 (0.93)	-0.191** (-2.02)
Private Firm	-0.723 (-0.60)	0.002 (0.13)	-0.094 (-1.24)	0.145** (2.57)
Log(Firm Age)	-0.074 (-0.97)	-0.002 (-1.55)	-0.006 (-1.58)	0.004 (1.26)
Firm Leverage	0.456 (0.16)	-0.041 (-0.95)	-0.654*** (-3.98)	-0.192 (-1.58)
Log(Firm Size)	0.757 (1.23)	-0.005 (-0.54)	0.329*** (10.79)	0.080*** (3.54)
Profitability	-1.177 (-0.32)	0.068 (1.22)	-0.877*** (-4.48)	1.924*** (13.30)
Media Coverage	0.000 (0.12)	0.000 (0.27)	0.003 (0.49)	-0.006 (-0.25)
Intercept	-18.515 (-1.28)	-0.170 (-0.79)	3.460*** (4.69)	6.799*** (12.47)
Board indicators	Yes	Yes	Yes	Yes
Industry indicators	Yes	Yes	Yes	Yes
Year indicators	Yes	Yes	Yes	Yes
N	705	705	705	705
Adjusted R^2	0.061	0.087	0.238	0.340

Table 7. Two-Stage Regression Results for Analyst Coverage and IPO Performance

Panel A: Summary statistics of instrument variables

In this panel, *Industry Median Number of Analyst* is measured as the natural logarithm of the median number of analyst coverage in one industry. *Industry Leader* is an indicator for whether the firm is an industry leader, measured as whether its sales ranked among the top 30% in its industry. *Segments* is measured as the number of segments, including only those which sales exceeds 30% of firm's total sales.

	N	Mean	Median	Standard Deviation
Industry Median Number of Analyst	1075	8.908	9.000	5.191
Industry Leader	1075	0.139	0.000	0.347
Segments	1075	1.095	1.000	0.298

Table 7. Two-Stage Regression Results for Analyst Coverage and IPO Performance (Continued)

Panel B: Two-Stage Regression Results

This panel presents the two-stage regression results of analyst coverage on IPO initial return. Predicted coverage is the predicted value of analyst coverage based on the estimation in the first-stage model. The lower part of this panel shows the partial F -statistic and the partial R^2 from the first stage regression and the values for the two specification tests: the test of over-identifying restrictions using Sargan test and the Hausman test.

	First Stage	Second Stage
	Analyst Coverage	IPO First-Day Return
Predicted Coverage		0.037** (2.45)
Industry Median Number of Analyst	0.054*** (3.00)	
Industry Leader	0.205*** (3.38)	
Segments	0.542* (1.79)	
Market Return	8.547*** (3.74)	0.850 (1.07)
Reputable Underwriter	-0.031 (-0.09)	0.007 (0.14)
Big 4	0.751 (1.08)	-0.077 (-0.68)
Price Revision	1.398*** (2.81)	-0.007 (-0.05)
Offer Ratio	-7.137** (-2.01)	-0.418 (-0.54)
Largest Ownership	-0.137 (-0.16)	0.127 (1.02)
Private Firm	-1.108*** (-2.63)	-0.062 (-0.57)
Log(Firm Age)	0.010 (0.36)	-0.004 (-1.02)
Firm Leverage	-0.956 (-0.89)	0.190 (1.11)
Log(Firm Size)	-0.024 (-0.11)	-0.178*** (-5.94)
Profitability	-1.337 (-1.00)	-1.025*** (-4.64)
Media Coverage	0.025 (0.75)	0.019 (1.28)
Intercept	13.714*** (2.71)	3.862*** (2.62)
Board indicators	Yes	Yes
Industry indicators	Yes	Yes
Year indicators	Yes	Yes
N	1075	1075
Adjusted R^2	0.337	0.251
Partial F-statistic:	38.761	
First Stage		
Partial R^2 :	0.215	

First Stage	
Over-identifying	1.392
restrictions	
Hausman test	3.273

Table 7. Two-Stage Regression Results for Analyst Coverage and IPO Performance (Continued)**Panel C: Two-Stage Regression Results for Analyst Coverage and Post-IPO BHARs**

This panel presents the two-stage regression results of analyst coverage on one-year post-IPO BHARs. Predicted coverage is the predicted value of analyst coverage based on the estimation in the first-stage model. The lower part of this panel shows the partial F -statistic and the partial R^2 from the first stage regression and the values for the two specification tests: the test of over-identifying restrictions using Sargan test and the Hausman test.

	First Stage		Second Stage	
	Analyst Coverage	Return in Excess of Equally Weighted All A-Share Stocks Index	Return in Excess of Tradable Value Weighted All A-Share Stocks Index	Return in Excess of Size and B/M Matching Portfolios
Predicted Coverage		-0.120** (-2.48)	-0.076* (-1.81)	-0.040* (-1.70)
Predicted Coverage*		-0.008***	-0.005***	-0.004**
First-Day Return		(-2.63)	(-3.10)	(-2.03)
Industry Median Number of Analyst	0.063** (2.30)			
Industry Leader	0.347*** (2.76)			
Segments	0.393* (1.82)			
First-Day Return	3.015*** (13.95)	-0.177 (-0.77)	-0.037 (-1.17)	-0.038 (-0.20)
Reputable Underwriter	-0.067 (-0.22)	0.101** (2.54)	0.069* (1.88)	0.082** (2.46)
Big 4	0.936 (1.47)	0.144 (1.48)	0.085 (0.94)	0.036 (0.44)
Price Revision	1.094** (2.44)	0.115 (1.21)	-0.084 (-0.94)	-0.080 (-0.99)
Offer Ratio	-5.905* (-1.83)	-0.856 (-1.54)	-0.775 (-1.50)	-0.306 (-0.65)

Largest Ownership	-0.517 (-0.65)	-0.046 (-0.43)	-0.031 (-0.31)	0.014 (0.16)
Private Firm	-0.805** (-2.09)	-0.080 (-1.11)	-0.080 (-1.19)	-0.042 (-0.68)
Log(Firm Age)	0.018 (0.71)	0.004 (1.04)	0.002 (0.61)	0.002 (0.60)
Firm Leverage	-1.402 (-1.42)	-0.162 (-1.04)	-0.113 (-0.78)	-0.080 (-0.61)
Log(Firm Size)	0.522** (2.57)	0.023 (0.59)	-0.008 (-0.22)	-0.007 (-0.22)
Profitability	1.917 (1.55)	0.232 (1.16)	0.156 (0.84)	0.186 (1.10)
Media Coverage	0.031 (0.96)	0.012 (0.53)	0.018 (1.20)	0.007 (0.46)
Intercept	0.793 (0.17)	1.151* (1.87)	1.50 *** (2.64)	0.930* (1.80)
Board indicators	Yes	Yes	Yes	Yes
Industry indicators	Yes	Yes	Yes	Yes
Year indicators	Yes	Yes	Yes	Yes
N	1075	1075	1075	1075

Adjusted R^2	0.316	0.294	0.263	0.147
Partial F-statistic: First Stage	39.874			
Partial R^2 : First Stage	0.225			
Over-identifying restrictions		1.262	1.437	1.571
Hausman test		4.153	3.262	5.101

Table 8. Bull Market Sample and Non-Bull Market Sample

This table presents the regression results of analyst coverage on IPO performance, for bull market period and non-bull market period samples, respectively. A bull market period is defined as a year in which the return of tradable value-weighted all A share index exceeds 100%, corresponding to year 2006, 2007 and 2009 for the sample in China. Non-bull market period then corresponds to year 2008, 2010, 2011 and 2012.

In panel A, the dependent variable is the IPO initial return. In panel B, the dependent variable is the one-year post-IPO stock performance, measured as buy and hold abnormal returns (BHAR) in excess of size and B/M matching portfolios. *Analyst Coverage* is defined as the number of analysts who covered an IPO firm in the new issue market. Control variables are defined in Table 2. Year, industry and board dummies are included but not reported, *t*-statistics are given in parentheses and computed using heteroskedasticity-robust standard errors clustered by industry and year (Petersen, 2009; Thompson, 2011). In all these specifications, continuous variables are winsorized at the top and bottom 1%. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Panel A: Effect of Analyst Coverage on IPO Initial Return

	IPO Initial Return	
	Bull Market Period	Non-Bull Market Period
Analyst Coverage	0.058*** (5.56)	0.059*** (15.45)
Market Return	0.830 (1.25)	0.759*** (2.79)
Reputable Underwriter	0.073 (0.73)	-0.001 (-0.01)
Big 4	-0.026 (-0.15)	-0.022 (-0.26)
Price Revision	0.057 (0.51)	-0.082 (-1.12)
Offer Ratio	0.701 (0.77)	-0.749* (-1.67)
Largest Ownership	0.449 (1.52)	0.020 (0.21)
Private Firm	-0.039 (-0.35)	-0.062 (-1.22)
Log(Firm Age)	-0.007 (-0.69)	-0.005 (-1.61)
Firm Leverage	0.498 (1.36)	0.175 (1.51)
Log(Firm Size)	-0.248*** (-3.98)	-0.148*** (-6.27)
Profitability	-1.214*** (-2.76)	-0.909*** (-6.48)
Media Coverage	0.042 (1.37)	0.019 (0.52)
Intercept	4.067*** (2.87)	3.269 *** (5.74)
Board indicators	Yes	Yes
Industry indicators	Yes	Yes
Year indicators	Yes	Yes
N	290	785
Adjusted R^2	0.420	0.411

Table 8. Further Analysis for Market-wide Sentiment: Bull Market Sample and Non-Bull Market Sample (Continued)

Panel B: Effect of Analyst Coverage on One-year Post-IPO BHARs

	One-year Post-IPO BHARs	
	Bull Market Period	Non-Bull Market Period
Analyst Coverage	-0.005 (-0.43)	-0.005 (-1.34)
Analyst Coverage*	-0.004***	-0.006***
First-Day Return	(-3.58)	(-4.67)
First-Day Return	-0.079 (-0.85)	-0.106** (-2.42)
Reputable Underwriter	0.118 (1.63)	0.035 (1.21)
Big 4	-0.097 (-0.75)	0.002 (0.03)
Price Revision	-0.182** (-2.36)	0.016 (0.28)
Offer Ratio	-0.940 (-1.41)	0.470 (1.34)
Largest Ownership	-0.184 (-0.85)	0.059 (0.80)
Private Firm	0.107 (1.31)	-0.071* (-1.78)
Log(Firm Age)	0.001 (0.12)	0.002 (0.67)
Firm Leverage	0.200 (0.74)	-0.057 (-0.63)
Log(Firm Size)	-0.021 (-0.45)	-0.035 (-1.86)
Profitability	0.434 (1.34)	-0.039 (-0.35)
Media Coverage	0.003 (0.92)	-0.008 (-1.17)
Intercept	0.834 (0.78)	0.730 (1.61)
Board indicators	Yes	Yes
Industry indicators	Yes	Yes
Year indicators	Yes	Yes
N	290	785
Adjusted R^2	0.147	0.051

Table 9. Controlling for Firm-level Sentiment

This table presents the regression results of analyst coverage on IPO performance, controlling for firm-specific investor sentiment, defined as the oversubscription rate. In panel A, the dependent variable is the IPO initial return. In panel B, the dependent variable is the one-year post-IPO stock performance, measured as the buy and hold abnormal return (BHAR) in excess of size and B/M matching portfolios. *Analyst Coverage* is defined as the number of analysts which covered an IPO firm in the new issue market. Control variables are defined in Table 2. Year, industry, and board dummies are included but not reported, *t*-statistics are given in parentheses and computed using heteroskedasticity-robust standard errors clustered by industry and year (Petersen, 2009; Thompson, 2011). In all these specifications, continuous variables are winsorized at the top and bottom 1%. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Panel A: IPO Initial Return

	(1) Attention	(2) Sentiment	(3) Horse Race
Analyst Coverage	0.059*** (15.26)		0.056*** (14.56)
Oversubscription Rate		0.014*** (5.55)	0.011 (0.91)
Market Return	1.191*** (4.05)	1.440*** (4.92)	0.929*** (3.45)
Reputable Underwriter	0.010 (0.23)	0.005 (0.12)	0.010 (0.25)
Big 4	0.053 (0.63)	0.002 (0.02)	0.070 (0.91)
Price Revision	0.089* (1.73)	0.086 (1.37)	0.005 (0.08)
Offer Ratio	-0.646 (-1.45)	-0.591 (-1.35)	-0.303 (-0.75)
Largest Ownership	0.149 (1.34)	0.125 (1.14)	0.120 (1.20)
Private Firm	-0.111 (-1.30)	-0.110** (-2.11)	-0.037 (-0.78)
Log(Firm Age)	-0.003 (-0.72)	-0.003 (-0.74)	-0.004 (-1.31)
Firm Leverage	0.236* (1.74)	0.176 (1.31)	0.221* (1.80)
Log(Firm Size)	-0.173*** (-7.48)	-0.174*** (-6.71)	-0.165*** (-6.96)
Profitability	-1.076*** (-6.40)	-0.893*** (-5.37)	-0.840*** (-5.54)
Media Coverage	0.041 (0.13)	0.038 (0.27)	0.034 (0.19)
Intercept	4.081*** (7.91)	4.244*** (7.01)	3.330*** (5.99)
Year indicators	Yes	Yes	Yes
Industry indicators	Yes	Yes	Yes
Board indicators	Yes	Yes	Yes
N	1075	1075	1075

Adjusted R^2	0.359	0.362	0.371
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Table 9. Controlling for Firm-level Sentiment (Continued)

Panel B: One-year Post-IPO BHARs

	(1) Attention	(2) Sentiment	(3) Horse Race
Analyst Coverage	-0.006*** (-2.93)		-0.003*** (-2.78)
Analyst Coverage*	-0.004***		-0.005***
First-Day Return	(-3.22)		(-3.07)
Oversubscription Rate		-0.004 (-1.05)	-0.005 (-1.23)
Oversubscription Rate*		-0.002	0.002
First-Day Return		(-1.30)	(1.44)
First-Day Return	-0.065 (-1.29)	-0.084*** (-3.36)	-0.184*** (-3.03)
Reputable Underwriter	0.063** (2.21)	0.062** (2.16)	0.064** (2.23)
Big 4	-0.010 (-0.18)	-0.001 (-0.01)	-0.003 (-0.06)
Price Revision	-0.095** (-2.20)	-0.076* (-1.76)	-0.087** (-1.99)
Offer Ratio	0.049 (0.16)	-0.003 (-0.01)	0.046 (0.15)
Largest Ownership	0.010 (0.14)	0.009 (0.12)	0.013 (0.17)
Private Firm	0.000 (-0.00)	-0.012 (-0.34)	-0.009 (-0.24)
Log(Firm Age)	0.001 (0.46)	0.001 (0.58)	0.001 (0.44)
Firm Leverage	0.004 (0.05)	-0.012 (-0.13)	0.011 (0.12)
Log(Firm Size)	-0.026 (-1.40)	-0.021 (-1.12)	-0.026 (-1.39)
Profitability	0.052 (0.45)	0.083 (0.70)	0.056 (0.48)
Media Coverage	0.003 (0.45)	0.007 (1.25)	-0.002 (-0.39)
Intercept	0.587 (1.38)	0.619 (1.43)	0.694 (1.59)
Year indicators	Yes	Yes	Yes
Industry indicators	Yes	Yes	Yes
Board indicators	Yes	Yes	Yes
Number	1075	1075	1075
Adjusted R^2	0.142	0.138	0.145

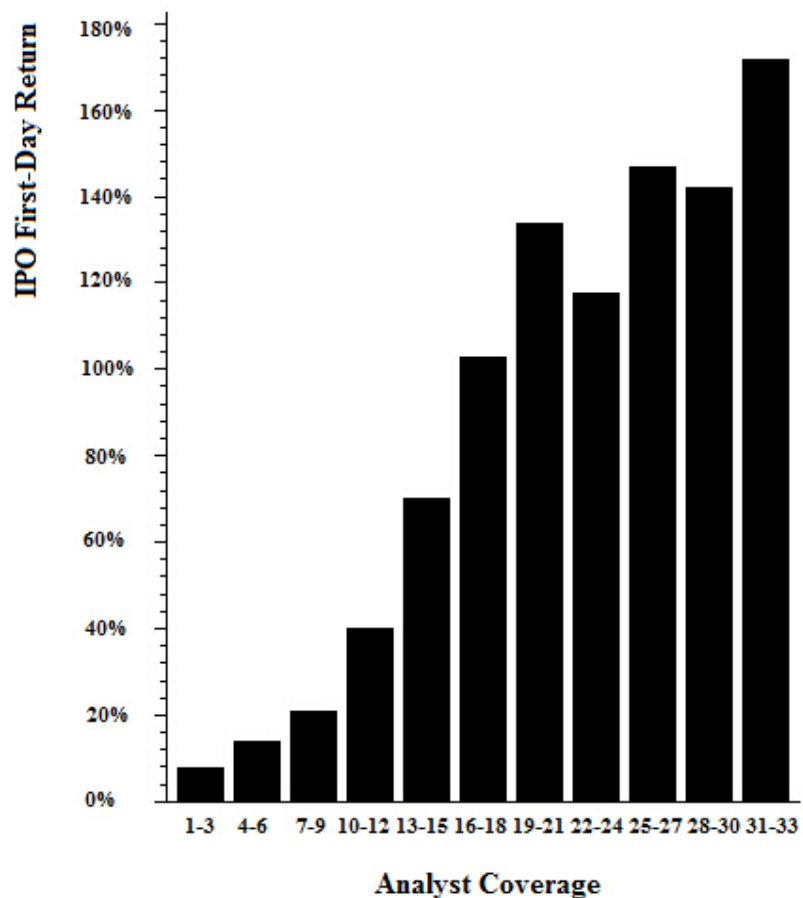
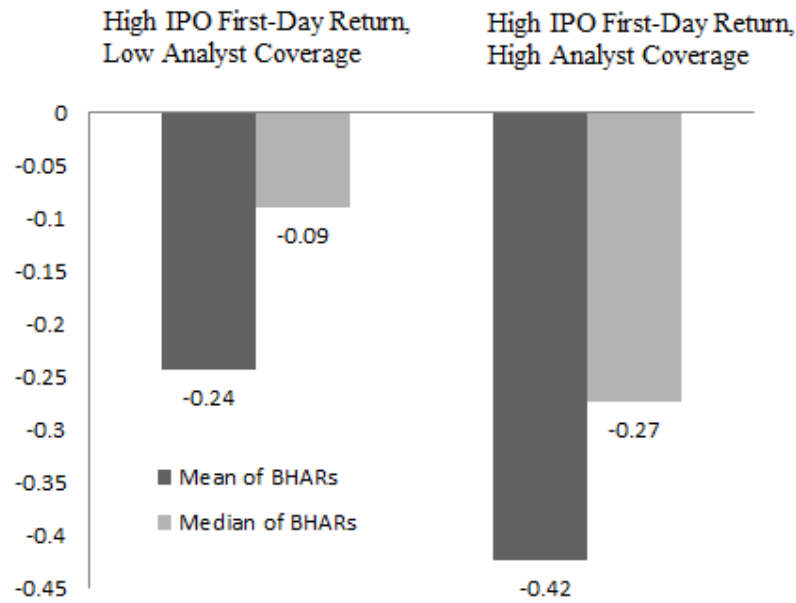


Figure 1. Analyst Coverage and IPO First-Day Return

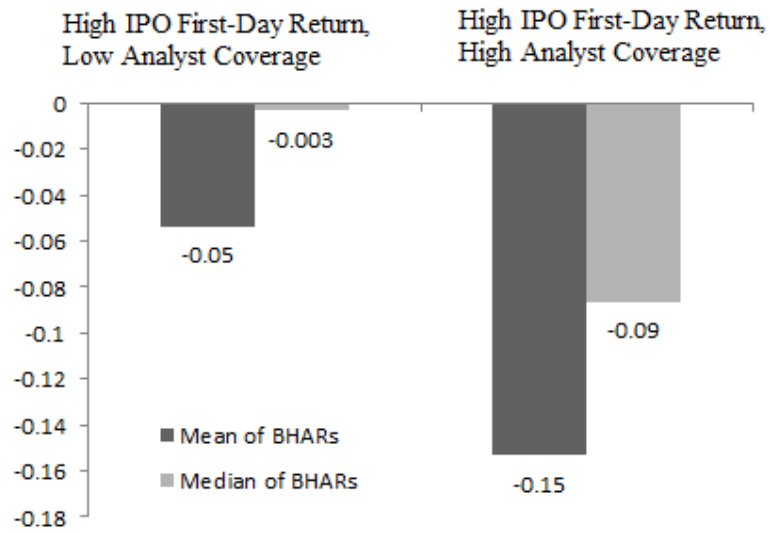
This figure plots analyst coverage and IPO first-day returns. The sample period is from 2006 to 2012. *Analyst Coverage* is measured as the number of analysts who covered an IPO firm in the new issue market. *IPO first-day return* is measured as the percentage change from IPO offer price to the first-day close price.



Panel A: Return in Excess of Equally Weighted all A-Share Stocks Index

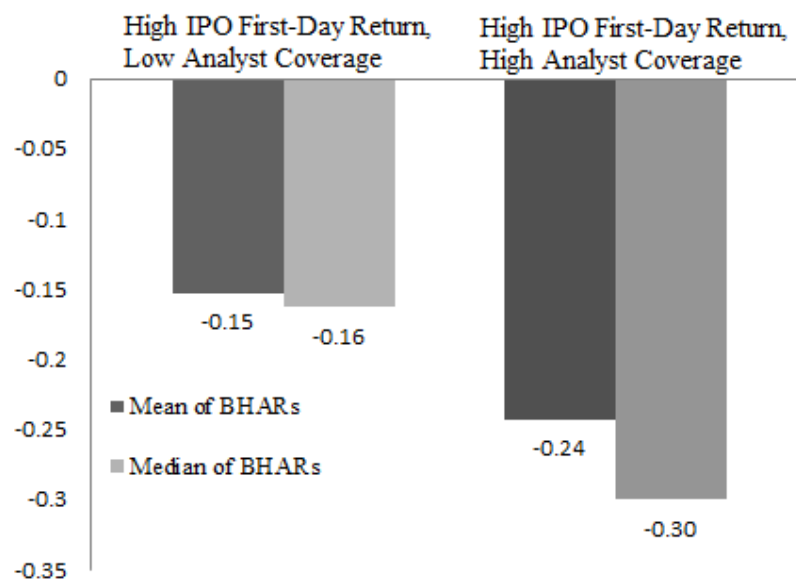
Figure 2. Analyst Coverage, Average First-Day Return and Post-IPO Performance

This figure plots analyst coverage and post-IPO buy-and-hold abnormal returns (BHARs) from the 5th trading day to the 256th trading day when the IPO initial return is above the total sample median. The sample period is from 2006 to 2012. There are 537 IPOs in this figure. In panel A, BHARs is measured as return in excess of equally weighted all A-share stocks index. In panel B, BHARs is measured as return in excess of tradable value weighted all A-share stocks index. In panel C, BHARs is measured as return in excess of size and B/M matching portfolios.



Panel B: Return in Excess of Tradable Value Weighted all A-Share Stocks Index

Figure 2. Analyst Coverage, Average First-Day Return and Post-IPO Performance (Continued)



Panel C: Return in Excess of Size and B/M Matching Portfolios

**Figure 2. Analyst Coverage, Average First-Day Return and Post-IPO Performance
(Continued)**