Chinese Media Coverage, Divergence of Opinion, and Stock Market Outcomes

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Abstract: This paper examines the role of financial news coverage in China's stock market, and, in so doing, sheds some light on the underlying mechanisms of media influence. Our results show that firms with more media coverage are associated with higher probabilities of mispricing and stock price crashes as well as lower expected returns and more active trading. Further, companies with more media coverage are associated with larger bid-ask spreads and higher analyst forecast dispersion. Our cross-sectional and event study evidence suggests that the mass media affect China's stock market primarily by increasing disagreement among investors, consistent with Miller (1977).

Key words: Media coverage, divergence of opinion, mispricing, stock price crash, bid-ask spread.

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The role of media coverage in financial markets has recently attracted much academic and practitioner interest. At an empirical level, for example, media coverage has been found to affect expected returns, trading volume, momentum/reversal, and governance issues (Tetlock, Saar-Tsechansky and Macskassy (2008), Fang and Peress (2009), and Tetlock, 2011).[1] This strong research interest is not surprising given the important role of the media in disseminating information to a broad spectrum of individuals, especially investors. However, at the theoretical level, the linkages between media coverage and market outcomes are less clear. For example, based on Miller's (1977) theoretical framework, media coverage is expected to lead to divergence of opinion whereas based on Merton's (1987) framework, media coverage is expected to reduce information asymmetries and enhance investor recognition.

In this paper we extend this research by examining the effects of media coverage on a large number of interconnected market outcomes in China's stock market. In so doing, we test the two competing theories of media influence and shed some light on the underlying mechanisms through which the media affect the stock market, and, in this way, contribute to a better understanding of the source and the nature of media

1 A detailed literature review appears in Section I.

influence in financial markets in general, and in China, in particular.

Two primary factors motivate this study. First, most of the prior studies have been conducted in the US and there is little evidence in emerging economies such as China. The US setting is characterized by high investor protection, freedom of the press and professional investors who are able to actively engage in arbitrage activities that could help to move the market towards efficiency. In contrast, the Chinese setting is characterized by weak investor protection and strong political influence over both the listed companies and the press. Due to the absence of an empowered and independent press, reporters in China are often denied access to corporate information, and there have been a growing number of lawsuits in which the news media and the reporters involved are faced with charges of libel and, in some cases, fines (Chen (2005)). The threat of these lawsuits has affected press freedom and truthful reporting by the media (Esarey (2006), and Pan (2006)). In addition, the requirement of the China Securities Regulatory Committee (CSRC) that all mandatory information disclosures be published in at least one of seven designated publications leads to a lack of competition and hence possible "media capture" (Besley and Prat (2006), and Houston, Lin and Ma (2011)). It is also quite common for the Chinese financial news industry to be criticized by the public for lacking in professionalism and thriving on rumors (Pan (2006)). Moreover, the Chinese stock market differs from the US in

many other respects such as the predominance of unsophisticated retail investors, strictly binding short-sales constraints, and a general lack of institutionalized investor protection mechanisms. Given these significant institutional and market differences, an interesting question is whether the media play a role in the Chinese market and, if so, how this role affects market outcomes.

Second, at a general level, most empirical studies (with the probable exceptions of Engelberg and Parsons (2011), Tetlock (2011), and Dougal et al. (2011)) have failed to systematically test competing theories of media influence by probing into the specific channels or mechanisms through which the media affect the stock market. As we show later, while both Miller (1977) and Merton (1987) imply a negative association between expected return and the extent of media coverage, they have divergent predictions for other aspects of market outcomes, such as bid-ask spread and stock mispricing. We test these divergent predictions in order to better understand the mechanisms of media influence in financial markets. Specifically, we extend the analyses to cover different market outcomes of possible media effects and, by doing so, provide additional assurance that the inference regarding the underlying mechanism of media influence is not peculiar to one or two specific outcomes.

Using all A-shares listed in China's stock market during 2000-2009, we find that stocks of firms with higher media coverage earn lower future returns and have

more active trading, consistent with the finding of Fang and Peress (2009) and Engelberg and Parsons (2011) in the US market. Further, we find that media coverage is positively associated with stock mispricing and probability of stock price crashes. To understand how media coverage drives stock pricing and returns, we conduct a battery of trading-based tests aimed at discriminating between the asymmetric information resolution role versus the divergence of opinion effect of media coverage. We find that in the cross section, more media coverage is associated with larger bid-ask spread and greater analyst forecast dispersion (but not forecast accuracy). Further event study evidence supports the hypothesis that divergence of opinion increases upon the publication of firm-specific news. Our results are robust to controlling for potential endogeneity, different model specifications, different estimation methods and different variable definitions and measurement. Overall, our evidence indicates that media coverage in the Chinese emerging stock market influences stock market outcomes primarily by increasing disagreement among investors; the strength of this effect in many cases dominates the asymmetric information resolution effect. We suggest that to a large extent, the institutional environment in China as it relates to the news media, and characteristics of investor behavior in China jointly contribute to such an outcome.

Our study complements and extends recent studies conducted in the US on the

presence and source of media effect. These include Fang and Peress (2009), who suggest that the breadth of media coverage reduces expected returns; Barber and Odean (2008), who suggest that the media affect stock trading by grabbing investors' attention; and Tetlock (2010), who suggests that public financial news resolves asymmetric information. Our paper is most closely related to several recent papers that focus on examining the mechanisms underlying media influence. Among these, Engelberg and Parsons (2011) provide evidence that media coverage causes stock trading activity. Dougal et al. (2011) find that the writing of Wall Street Journal columnists has a causal effect on aggregate market outcomes. Tetlock (2011) presents evidence that individual investors overreact to stale information contained in the news. While not necessarily negating the interpretation of the source of media effect documented in these US-based studies, the evidence in this paper offers an alternative view on the specific manner in which the media impact stock market participants, i.e. by increasing divergence of opinion among investors. Since prior US-based studies have not systematically explored, let alone ruled out, such a possibility (which is well grounded in theory—see literature review below), our results also call for a re-examination or re-interpretation of the results in previous studies, as well as further research on media influence in financial markets.

We contribute to the literature in two major ways. First, we try to uncover the

underlying mechanisms of media influence by designing multiple tests using a number of interconnected market outcomes. A consistent conclusion that emerges from our results is that media coverage exerts an influence on the stock market primarily by increasing divergence of opinion among investors. This is a new finding, and contrasts with alternative views expressed in the literature with respect to the source and nature of media influence in financial markets. Our second contribution lies in highlighting the importance of the institutional environment in shaping the role and effects of the media. While investors in countries with a free press and media competition may benefit from value-relevant information or public monitoring provided by the media, in a country where both the media and the majority of the listed companies are under State ownership/control, media coverage not only may provide superficial or superfluous information, but may even induce investor speculation and greater investor uncertainty.

The rest of the paper is organized as follows. Section I reviews the literature on the role of the media, focusing on the mechanisms through which the media may exert an influence. Section II provides some background information about China's stock market and its financial news media. Section III develops the hypotheses, Section IV discusses the sample data and variable measurement, and Section V presents the empirical results. Section VI provides a summary and concludes.

I. Literature Review

A. *The Media and Stock Market Outcomes*

A review of the prior literature suggests that evidence on the link between media coverage and financial outcomes is somewhat mixed. One school of thought holds that the press plays a positive role in corporate finance and corporate governance, by promoting corporate transparency through information dissemination, and by placing public pressure on key decision-makers (Dyck and Zingales (2002)). At the individual firm level, for example, media coverage has been found to affect expected returns (Fang and Peress (2009), and Kothari, Li and Short (2009)), trading volume (Barber and Odean (2008), and Engelberg and Parsons (2011)), momentum/reversal (Chan (2003), Vega (2006), and Tetlock (2010, 2011)), and governance issues (Dyck et al. (2008, 2010)). Another stream of the literature, however, suggests that news in the media is not linked to stock pricing/trading (Cutler, Poterba and Summers (1989), Mitchell and Mulherin (1994), Berry and Howe (1994), Fair (2002), and Griffin, Hirschey and Kelly (2010)) or governance choices (Core, Guay and Larcker (2008)). Yet another view suggests that the media may even play a negative role, for example, by sensationalizing issues in order to sell papers (Jensen (1979), and Core et al. (2008)), engaging in discretionary rather than unbiased press coverage (DeAngelo, DeAngelo and Gilson (1994, 1996), Dyck and Zingales (2003), and Gentzkow and

Shapiro (2006)), and possibly misinforming investors and causing mispricing (Moss (2004), and Chen, Pantzalis and Park (2009)). Thus the existing academic literature provides a rather disparate, and often conflicting, view of the roles and effects of the news media.[2]

At the conceptual level, much remains to be learned about the preconditions for the news media to exert an influence. For example, Dyck et al. (2008) find that in Russia, a bad corporate governance decision is more likely to be reverted following an

2 In principle one can distinguish between the information production function of the media and the information dissemination function of the media, although such a distinction has largely been absent from much of the literature (such omission may be responsible for some of the confusions and conflicts with respect to the roles/effects of the media). In some contexts, it may be important to make such a distinction. Soltes (2009), for example, focuses on examining the dissemination impact of the press by varying the accessibility of news but not its content in order to examine if differential distribution of information is important. Solomon (2011) examines how firms' use of investor relations (IR) firms affects media coverage of good and bad corporate news and consequently announcement returns. An important consideration in their emphasis on separating the information production function and the information dissemination function of the media is the potential endogeneity between company-level news and media reporting (i.e. whether a change in media coverage represents a change in press interest, or a change in company conditions). Fang and Peress (2009) distinguish between "news" and "coverage" by noting that many stocks with news (e.g. headlines in Dow Jones Newswires) remain neglected by the mass media. They also note that news articles published in the mass print media are unlikely to contain genuine news due to publication lags. However, this does not rule out the possibility that certain investors may still be influenced by such "news" (see, for example, Tetlock (2011)). In our paper, we tackle endogeneity between media coverage and a specific market outcome by explicitly taking into account their interrelation (e.g. via two-stage least squares regression). We do not find it practicable to examine the impact of information dissemination completely separate from the underlying news (as perceived by the readers; such perception may be influenced inter alia by the linguistic tone of the news reports—see Tetlock (2007) and Dougal et al. (2011)). In fact, one of the key functions of the media is to produce value-relevant information. We suggest that our results may best be understood as capturing the combined effects of the information production and the information dissemination roles of the media as well as how such information is processed by investors.

increase in coverage of the event in Anglo-American newspapers, but not if the coverage appears in the local press. This raises the possibility that media coverage *per se* does not exert an influence; rather, it may be the quality (e.g. relevance to the target audience, independence, credibility) of media coverage that brings about an impact. In a cross-country context, Griffin et al. (2010) find that stock prices move much more on news days than non-news days in most developed markets, but they find little relation between returns and news in many emerging markets, raising the possibility that investors in those emerging markets either do not pay attention to market or firm fundamentals (as conveyed in the news reports) when pricing stocks, or they do not find news reports in their country trustworthy or useful. Thus, characteristics of the media and investors as well as other institutional features (e.g. firms' information environment) may all have a bearing on the potential impacts of media coverage. So far, relatively few studies have been conducted outside the US on the roles and effects of the media in financial markets.

B. Mechanisms of Media Influence and Related Empirical Evidence

B1. Divergence of Opinion versus Information Asymmetry Reduction

Two relevant theories on media influence in finance are by Miller (1977) and Merton (1987).[3] In Miller's (1977) "divergence of opinion" framework, the market

3 Veldkamp (2006) presents a theory of media-driven frenzies in which asset market movements generate news and news raises prices and price dispersion across markets.

price of a stock reflects the opinion of the optimists. Several interesting implications that emerge from Miller's framework include the fact that, if investors differ in the precisions of their prior private information (Kim and Verrecchia (1991)) or interpret public signals differentially (Kandel and Pearson (1995)), dispersion of beliefs among investors may increase as more public information arrives. Given short-sales constraints, greater divergence of opinion may cause the stock price to rise (to the extent of overvaluation) and future return to fall (Chen, Hong and Stein (2002), and Diether, Malloy and Scherbina (2002)). Further, the stocks of firms with relatively more media coverage tend to be more actively traded, because media coverage brings the stocks to the attention of a large group of potential investors, some of whom may choose to buy after further investigation. More intensive trading may also result when media coverage grabs investors' attention (Huberman and Regev (2001), and Barber and Odean (2008)), triggers positive feedback trading (Delong et al. (1990)), breeds familiarity (Huberman (2001)), changes the level of disagreement among investors (Hong and Stein (2007)), increases investor sentiment (Baker and Wurgler (2007)), or leads to overconfidence (Barber and Odean (2001), Scheinkman and Xiong (2003), and Statman, Thorley and Vorkink (2006)).[4] Finally, to the extent that bid-ask spread is positively associated with divergence of opinion (Handa, Schwartz and Tiwari

4 In this paper we do not attempt to distinguish among these different drivers of trading volume. However, they share something in common—they are likely to exert an influence when public news arrives, especially when such news leads to disagreement (Hong and Stein, 2007).

(2005), Garfinkel (2009)), stocks of companies with more media coverage may be associated with larger bid-ask spreads, other things being equal.[5] In a later section a more complete discussion of these and other implications of Miller's theory is provided.

Merton (1987) posits an asset pricing theory that deviates from the Sharpe-Lintner capital asset pricing model in that investors do not have full information about the available securities and thus choose to invest in the shares of companies they know about. In Merton's model, an investor is said to be "informed (know) about security k" if he knows the company's return-generating parameters, and all investors who know about security k are assumed to agree on these parameters (i.e. conditional homogeneous beliefs). Merton shows that in his model, an increase in the relative size of the firm's investor base will reduce the firm's cost of capital. He stresses that the media can affect a firm's investor base even if the current shareholders may already know all the information contained in the news stories. This can happen if the form of the prior public releases of the information did not capture widespread attention among investors, but the new form does. Two predictions of Merton's model have received considerable attention in the literature. First, stocks

5 Handa, Schwartz and Tiwari (2005) show that the size of the spread in a non-intermediated, order driven market (of which China is one example) is a function of differences in valuation among investors and of adverse selection. Garfinkel (2009) finds that bid-ask spread is the best proxy for opinion divergence in a sample of NYSE-listed firms without IBES forecast dispersion data (in other cases unexplained volume is the best proxy for opinion divergence).

with low investor recognition are associated with higher expected return. Second, idiosyncratic risk is a positively priced factor in the cross section. The first of these is empirically supported in Amihud, Mendelson and Uno (1999) and Fang and Peress (2009) amongst others, but evidence on the second is rather mixed (Ang et al. (2006, 2009), Boehme et al. (2009), Fu (2009), and Huang et al. (2010)).

While an application of both Miller's (1977) and Merton's (1987) theories concurs on the mass media's role in capturing widespread attention and affecting future returns, they, however, posit a different channel of influence. In Merton's information asymmetry reduction model, the media distribute information across investors who interpret it identically, thus contributing towards convergence of beliefs among investors, as opposed to divergence of beliefs in Miller's framework.

B2. The Empirical Evidence

Whether media coverage leads to convergence or divergence of beliefs is ultimately an empirical issue, and remains relatively underexplored in the extant literature. The limited existing studies provide conflicting evidence in this regard. For example, while Fang and Peress (2009) interpret the no-coverage premium phenomenon as supporting Merton's investor recognition hypothesis, they also find a positive correlation between media coverage and analyst forecast dispersion, which they suggest shows that media coverage does not lead to convergence of opinion. In

her study of post-earnings announcement drift in the US, Vega (2006) finds that, rather than resolving uncertainty and disagreement, media coverage Granger causes return volatility and dispersion of beliefs. The conclusions of Vega (2006) and Fang and Peress (2009) are not consistent with the conclusion reached by Tetlock (2010), who investigates whether public financial news in the US affects stock pricing and trading by resolving asymmetric information. His empirical evidence, based on the relationship between post-news returns and trading volume over short horizons, is broadly consistent with this hypothesis, and some of his evidence is inconsistent with alternative theories in which traders interpret news differently for rational or behavioral reasons.[6] In contrast, Barber and Odean (2008) posit that media coverage affects stock trading by grabbing investors' attention. They show that individual investors are net-buyers of attention-grabbing stocks, such as those in the news. This buying pattern has the effect of temporarily pushing up the prices of stocks in the news, causing a subsequent reversal when the buying pressure subsides. The empirical evidence in Fang and Peress (2009), however, does not support an attention-based explanation of the no-coverage premium phenomenon in the US, as they find the media effect stems from those stocks in oblivion rather than from the high-coverage stocks.

6 The evidence in Tetlock (2011) and Dougal et al (2011), however, is consistent with behavioral explanations of media effects.

C. *Summary*

As the literature review above reveals, so far there is very limited understanding on the specific mechanisms through which the media affect the stock market. The existing theories are predicated on assumptions of different (even opposite) underlying mechanisms of media influence (e.g. conditional homogenous beliefs in Merton, and divergence of opinion in Miller), but the appropriateness of such assumptions has not received unanimous empirical support, and the existing empirical evidence with respect to stock return and trading volume are consistent with both Miller (1977) and Merton (1987). In addition, almost all of the existing empirical studies are conducted in the US market setting, and most studies investigate only a small number of possible media effects separately (mainly stock return and trading volume). The conclusions on the presence/source/nature of media influence that emerge from these studies are either conflicting or inconclusive. More importantly, it is also not clear from the existing studies whether the hypothesized channel of media influence carries over to other (non-US) market settings and/or is supported by multiple measures of market outcomes.

II. Background Information on China's Stock Market and Financial News Media

Since its establishment in early 1990s, the modern Chinese stock market has

grown rapidly along with its fast-growing economy. Two peculiar characteristics of the Chinese stock market are its predominance by individual investors and their speculative, short-term trading behavior. According to the China Securities Regulatory Commission (CSRC, 2008), at the beginning of 2007 small-and-medium individual investors (those whose stock account values fall below 1 million RMB) account for 98.8% and 99.3% of the total number of stock accounts in the Shanghai Stock Exchange and Shenzhen Stock Exchange, respectively. And during early 2007, about 85% (77%) of the investors in terms of number of stock accounts in the Shanghai (Shenzhen) Stock Exchange hold their stocks for fewer than 3 months. Both institutional investors and (even more so) individual investors engage in very active trading, with the latter tending to hold and trade in stocks characterized by smaller capitalization, lower price, poorer performance, and higher price-earnings ratio (CRSC (2008)). The Chinese stock market also exhibits a relatively high level of stock synchronicity (Morck, Yeung and Yu (2000), and Gul, Kim and Qiu (2010)).

The role of the Chinese news media in terms of providing value-relevant information and public monitoring is severely limited due to a number of factors. In terms of institutions, these include the lack of press freedom and the lack of media competition, as discussed in the introduction. In terms of practice, some journalists allegedly submit their draft reports to the companies involved for approval before they

are released (Wang (2005), and Liu (2006)). It is also common practice for companies to give out "red packets" (ranging in value from RMB 500 to 1000 per interview) to news reporters during interviews.[7] Such practices, as well as alleged undue influences by government agencies (which own/control both the press and the listed company being scrutinized), are likely to result in a lack of media independence and credibility.

III. Hypotheses

The literature reviewed above (also see Healey and Palepu (2001), Shiller (2005), and Bhattacharya et al. (2009)) suggests that the news media can affect various aspects of stock market outcomes by reducing the information asymmetries associated with a firm, and/or by increasing opinion divergence among investors. In this section, we formulate separate hypotheses regarding the relations between media coverage and a number of interconnected stock market outcomes, first assuming that the role of media coverage is primarily to reduce information asymmetries by disseminating information to a broad audience who interpret it more or less identically. Where the context allows for an alternative view of the effect of media coverage (i.e. inducing disagreement among investors), we also formulate alternative predictions regarding the relationship between media coverage and the particular market outcome. Since

7 This is confirmed in our conversations with industry practitioners.

media coverage may simultaneously affect the distributions of information across investors and the differential interpretation of such information among investors, our goal is to investigate which of these effects dominate in a particular market outcome or a set of outcomes.[8] We divide our hypotheses into two main categories (stock pricing, and stock trading), each with subsidiary hypotheses.

The idea that media coverage is associated with expected return can be derived from both Miller (1977) and Merton (1987). While the negative relation between media coverage and expected return is empirically supported in Fang and Peress (2009) in the US setting, we test whether the relation also holds in China's emerging stock market (Hypothesis One).

Our second and third hypotheses concern the relations between media coverage and probability of stock mispricing and incidence of stock price crashes, respectively. Building on Miller (1977) amongst others, Hong and Stein (2007) suggest that disagreement among investors, combined with short-selling constraints, leads to a prediction that an increase in the number of news stories about a company has a

8 In other words, we do not consider the role of media coverage in reducing information asymmetry and its role in engendering/exacerbating divergence of opinion as diagonally opposed or mutually exclusive concepts. In reality, media coverage (or, for that matter, public information) can simultaneously reduce the degree of information asymmetry and increase dispersion of beliefs. Specifically, if media coverage brings new information from a small group of insiders to a larger group of shareholders, or if media coverage disseminates some "old" information (known to all current shareholders) to an even larger group of potential investors who do not previously know it, information asymmetry (i.e. the distributions of information among investors) may be reduced. However, if the investors who become aware of the same media reports have differing precisions in prior private information or interpret them differentially, then divergence of opinion may increase with media coverage at the same time as information asymmetry is reduced. Sarkar and Schwartz (2009) find that both asymmetric information and belief heterogeneity trigger trades; the importance of each depends on the type of news surrounding the trades.

systematic tendency to drive prices up, and that the degree of overpricing increases as the dispersion of valuations rises (i.e. as disagreement becomes more pronounced).[9] Hong and Stein (1999, 2003) argue that divergence of opinion coupled with short-sales constraints for at least some investors causes bearish investors' information to be incompletely incorporated into prices; such information tends to emerge during market declines and thus causes stock price crashes. Chen, Hong and Stein (2001) develop a model to forecast conditional skewness in the daily returns of individual stocks (i.e. crash likelihood). They predict and find that negative skewness is most pronounced in stocks that have experienced an increase in detrended trading volume (their proxy for the intensity of disagreement), and in stocks that have experienced positive returns over the prior months. On the other hand, Jin and Myers (2006) argue that opacity (lack of transparency) allows inside mangers to hide bad news until these accumulate to such a level that they cannot be concealed any longer, at which point all the bad news come out at once, causing stock prices to crash.

If the main effect of media coverage is to convey useful (value-relevant) information and/or monitor firms, then other things being equal, firms with more (less) media coverage are likely to have more (less) information available about them, and

9 Hong and Stein (2007) suggest three mechanisms that can generate investor disagreement: gradual information flow (from some investors to others), limited attention (i.e. investors react in an "attention-grabbing" manner), and heterogeneous priors (differential interpretation or use of information). They highlight an important role for the media in shaping the behavior of the stock market, through impacting these mechanisms that generate disagreement.

thus are more (less) transparent (Jin and Myers (2006), and Bushman, Piotroski and Smith (2004)). In such a situation, one would expect media coverage to be negatively associated with probabilities of stock mispricing and stock price crashes. On the other hand, if investors have differing precisions in private prior information (Kim and Verrecchia (1991)) and/or have differential interpretation of information disseminated by the media (Kim and Verrecchia (1994), and Kandel and Pearson (1995)), it is likely that firms with more media coverage may have stock prices that are high relative to fundamentals, especially when there are short sales constraints, and thus have a higher probability of subsequent stock price crashes and consequently lower stock returns (Chen et al. (2002), Hong and Stein (2007), and Chen et al. (2009)).[10]

Our second group of hypotheses concerns the relations between media coverage and stock liquidity (i.e. trading volume and bid-ask spread). Media coverage is expected to positively affect trading volume (Hypothesis Four) for a number of reasons. First, by disseminating information to a broad audience, media coverage may increase divergence of opinion and/or reduce information asymmetries, and both tend to increase trading (Kim and Verrecchia (1991), Harris and Raviv (1993), Kandel and Pearson (1995), Bamber, Barron and Stober (1999), and Chordia, Huh and Subrahmanyam (2007)). Second, to the extent that the media as a channel for mass

[10] It is also possible that the news media may engage in biased reporting (Moss (2004), Chen et al. (2009), and Gurun and Butler (2011)) or cause investors to be overconfident (Davis et al. (1994), and Joe (2003)). The predictions are also consistent with these interpretations.

communication grab investors' attention and provide topics for conversation-making and word-of-mouth information sharing (Shiller and Pound (1989), and Shiller (2005)), and to the extent that social interaction among investors facilitates more investment in the stock market (Hong, Kubik and Stein (2004)), it is expected that stocks of firms receiving more media coverage are more actively traded. Engelberg and Parsons (2011) provide evidence that local media coverage predicts local trading.

While the positive relation between media coverage (or more generally, public information arrival) and trading volume is generally well accepted, it is unclear to what extent this is attributable to the "information asymmetry resolution" effect versus the "divergence of opinion" effect. Unfortunately, attempts to discriminate between these two competing explanations are rare. No less ambiguous is the relation between media coverage and bid-ask spread, and what drives it (our Hypothesis Five).[11] In the context of public disclosures, Kim and Verrecchia (1994) suggest that earnings announcements provide information that allows certain traders to make judgments about a firm's performance that are superior to the judgments of other traders, and hence there may be more information asymmetry following public

11 In the US market setting Soltes (2009) finds that greater media dissemination of firms' press releases lowers bid-ask spreads, lowers idiosyncratic volatility, and increases trading volume. We affirm the last finding but our conclusions for the other two market outcomes are opposite to those reached by Soltes (2009). Our results on the (positive) relation between media coverage and idiosyncratic volatility are available upon request.

earnings announcements, which, in turn, is likely to lead to an increase in bid-ask spreads. If media coverage mainly serves to resolve or reduce information asymmetries about a firm, then one would expect a negative relation between media coverage and bid-ask spread, other things being equal (Botosan, 1997, 2000). Conversely, a positive relation is expected if media coverage mainly serves to engender or exacerbate divergence of belief among agents. To the best of our knowledge, there is little or no research on the relative validity or importance of the "information asymmetry resolution" versus the "divergence of opinion" effects of media coverage on bid-ask spread and trading volume.

Our Hypothesis Six concerns the link between media coverage and characteristics of analyst earnings forecasts. Much like media coverage, analyst coverage improves firm's information environments (Schipper (1991), Piotroski and Roulstone (2004), and Duarte et al. (2008)). Indeed, analyst following is often used as a proxy for information asymmetry, presumably because analyst following may mitigate problems of asymmetric information and thus estimation risk. The absolute value of forecast error has been used to proxy for information risk (Atiase and Bamber (1994)) while analyst forecast dispersion is found to reflect both diversity of analyst beliefs (Ajinkya, Atiase and Gift (1991), and Barron et al. (1998)), divergence of opinion among investors (Diether et al. (2002)), and information uncertainty

(Zhang (2006)). To the extent that the mass media enhance corporate transparency (Bushman et al. (2004)), and to the extent that the mass media disseminate information to a broad audience (Merton (1987)), other things being equal more media coverage should be associated with higher forecast accuracy and lower forecast dispersion. On the other hand, if analysts (or investors in general, whose views are summarized or mirrored in analyst forecasts—see Schipper (1991), and Core, Guay and Rusticus (2006)) have differential interpretation of public information made available by the media, more media coverage does not necessarily improve consensus forecast accuracy, and may even lead to higher forecast dispersion.

Although we propose the above hypotheses separately, some of the key variables may actually be interrelated, and some are potentially jointly determined. As an example of the first case, research suggests that trading volume and bid-ask spread are related (Stoll, 2000); liquidity is related to expected return (Amihud and Mendelson (1986), and Diamond and Verrecchia (1991)); and volatility, liquidity and expected returns are interrelated (Chordia, Huh and Subrahmanyam (2009)). As an example of the second case, both media coverage and trading volume may be determined by a third common factor (or set of factors), such as investor interest due to, for instance, visibility or brand recognition (Miller (1977), Grullon, Kanatas and Weston (2004), and Frieder and Subrahmanyam (2005)). While it provides an important cross-check

to simultaneously examine the effects of media coverage on each of these interrelated aspects of market outcomes using the same dataset, it is necessary to take into consideration the link among the relevant variables. We adopt three approaches to address potential endogeneity among the key variables. As a first control for potential endogeneity, we use the lagged values of an explanatory variable that is potentially jointly determined with the dependent variable. Second, when endogeneity is suspected we perform Two-Stage Least Square (2SLS) regressions and compare the results with those obtained from Ordinary Least Square (OLS) regressions. Third, we investigate multiple aspects of media effects and in this way avoid relying on any single piece of evidence. To the extent that these different aspects do not all suffer from the endogeneity problem, the various pieces of empirical evidence taken together are likely to shed light on the source and nature of media effects.

IV. Sample Selection and Variable Measurement

We first construct empirical measures of news coverage for all A-shares listed in China's two stock exchanges during the period 2000-2009 (IPO stocks trading for fewer than 200 days since listing are excluded to abstain from the well-documented IPO anomalies). We choose the year 2000 as the starting period for the following reasons: first, before the Securities Law was passed in 1999, the news media rarely

played any role in uncovering major corporate frauds or misdeeds (Pan, 2006). Second, the first report by the financial news media on major corporate misdeeds occurred in October 2000 when the Chinese language *Caijing* magazine published an article titled "Inside Story of Funds" (Caijing (2003)). This marked the beginning of whistle-blowing by the financial news media on corporate misdeeds in China and resulted in the CSRC stepping up regulatory monitoring (Pan (2006)). Thus the year 2000 may be taken as the beginning of the period when the general public and regulators became interested in the role of the financial news media. Third, the year 2000 is the first year in which the WiseNews database maintains searchable archives for most of the newspapers we use to compose empirical measures of news coverage. Finally, by choosing a sample period that covers a bearish period (2001-2005) and a bullish period (2006-2008) in China's stock market, we provide some assurance that the results are generalizable to different market conditions.

A. *Measurement of News Coverage*

A well-established measure of news coverage is currently lacking. Given the increasing recognition of the role of the press as a key variable or an important control variable in accounting, finance and economic studies (Miller (2006)), it is useful to explore the validity of different measures of news coverage and compare the results obtained. Our first measure of media coverage, NEWS-HITS, is a simple frequency count of the number of news articles (in which a company's full name or abbreviations or stock code is mentioned anywhere) that appear in the three major

national securities newspapers (*China Securities Journal*, *Securities Daily*, and *Shanghai Securities Journal*) in each calendar year. We add the news counts from all sources on the assumption that news stories appearing in more publications reach more readers. Our second measure of news coverage, NEWS-HEADLINE, is the number of articles from the aforesaid newspapers in which a company's full name/abbreviations/stock code appears in the headline or lead paragraph of the article. Our third measure, NEWS-DAYS, is the number of days in which a news story about a listed company is published in the three securities newspapers (multiple news stories on the same day are counted once).[12] The fourth measure of media coverage, NEWS-ALL, is the number of news articles about a specific firm published in 98 Chinese newspapers (including the aforesaid securities newspapers).[13] The last measure may overcome potential problems associated with use of the three national securities newspapers which are designated by CSRC as mandated corporate disclosure platforms. These measures of media coverage are separately used in all tests and the results are compared for robustness. To the extent that newspaper coverage is positively correlated with overall coverage across media types, the number of newspaper articles (or days with newspaper articles) is likely to proxy for overall media exposure (Fang and Peress (2009)).[14]

B. *Measurement of Stock Market Outcomes*

We measure expected return as the realized return over holding periods ranging

12 This measure of media coverage is similar to Chan (2003) and Duarte et al. (2008).

13 We thank GTA/CSMAR for providing these data. We do not compute a circulation-weighted measure of media coverage due to the lack of reliable circulation data.

14 Despite the rapid rise of the internet in China, the government still exercises considerable control over internet access and internet content. Also, much of the information circulated on the internet has previously appeared on the newspapers (CSRC requires important corporate information to be published in at least one of seven designated publications). Further, unlike newspaper coverage, information circulated on the internet may lack credibility. We leave to future research an investigation of the relation between other forms of media coverage (e.g. internet, radio and TV) and stock market outcomes.

from 1 month to 36 months after formation of portfolios which are rebalanced periodically. Various formation periods, ranging from 1 month to 6 months, are used (Fang and Peress (2009)). Following prior studies (e.g. Jones and Lamont (2002), Ali, Hwang and Trombley (2003), and Doukas, Kim and Pantzalis (2010)), we use market-to-book (MTB) ratio and price-to-book ratio (PB) adjusted for the industry-year average, as our proxies for stock mispricing.[15] As a robustness check, we use raw and industry-mean-adjusted Tobin's Q separately as alternative proxies for mispricing.[16] To take account of the illiquidity discounts of 70-80% in the Chinese market for non-tradable shares (Chen and Xiong (2002), and Bai et al. (2004)), we adjust the measurement of Tobin's Q by applying a 70% and 80% discount to the non-tradable shares relative to the market price of the tradable shares. The different measures of Tobin's Q (raw Tobin's Q, Tobin's Q adjusted for the industry average, and Tobin's Q adjusted for illiquidity) are separately used for a sensitivity check.

We compute two measures of crash likelihood following Chen et al. (2001) and Jin and Myers (2006). The first is the negative coefficient of skewness (NCSKEW),

15 In the Chinese context, MTB differs from PB when a firm has non-tradable shares, which do not have a readily observable market price. The numerator in the MTB ratio is the sum of the market capitalization of tradable shares and the book value of the non-tradable shares. Price-to-earnings ratio is not used here as the ratio becomes unusable when earning is very small or negative. Deleting these cases still leaves us with many extreme values for the price-to-earnings ratio.

16 Lang and Stulz (1994) argue that Tobin's Q has the benefits of requiring no risk adjustment or normalization and yields a direct measure of market valuation that is comparable across firms. Bai et al. (2004), Wei, Xie and Zhang (2005) and Chen, Firth and Xu (2009) use Tobin's Q to measure firm value in China. As another robustness check, we also use cumulative market-model abnormal returns as a measure of mispricing and obtain quantitatively similar results (not tabulated).

calculated by taking the negative of (the sample analog to) the third moment of each stock's daily market-model residual returns and dividing it by (the sample analog to) the cubed standard deviation of daily residual returns. An increase in NCSKEW corresponds to a stock being more "crash prone" (Chen et al. (2001), and Kim, Li and Zhang (2011)). The second measure follows Jin and Myers (2006) and is based on the number of residual returns exceeding k standard deviations above and below the mean, with k chosen to generate frequencies of 0.01%, 0.1% or 1% in the lognormal distribution. We subtract the upside frequencies from the downside frequencies and label the difference JMCRASH; a high value of JMCRASH indicates a high frequency of crashes. We also develop a simple but intuitive measure of incidences of large negative abnormal returns (CRASHFQ), calculated by taking the number of negative daily residual returns in a given year that exceed 3.09 standard deviations and dividing it by the total number of trading days per year (c.f. Hutton, Marcus and Tehranian (2009)). A large value of CRASHFQ indicates a high frequency of large negative abnormal returns (i.e. higher crash likelihood).

We measure trading volume by stock turnover (TURNOVER), defined as the ratio of number of shares traded to number of tradable shares outstanding (Lo and Wang (2000)). We use a number of different measures of stock turnover, including raw turnover, detrended turnover (200-day-moving-average-adjusted), standardized

turnover (raw turnover scaled by standard deviation of turnover in prior year), market-adjusted turnover, and Garfinkel's (2009) standardized unexplained volume (SUV).[17] In addition, we compute the proportion of zero-return days following Lesmond, Ogden and Trzcinka (1999) as an additional proxy for illiquidity.[18] Following Chordia et al. (2007), in our trading volume regressions we include proxies for visibility (media coverage, firm age, book-to-market ratio, stock price), mass of informed agents (analyst following, institutional ownership), extent of estimation uncertainty (stock beta, earnings volatility) and past performance (return in past year) in addition to other controls.

The firm-level measure of bid-ask spread (BIDASK) in our cross-sectional tests is the annual average of daily average relative spreads (the difference between quoted best ask and quoted best bid, divided by bid-ask mid-point, alternatively by closing stock price). We also decompose bid-ask spread into an adverse selection component following Glosten and Harris (1988), and a divergence of opinion component following Handa et al. (2005). We also compute a direct measure of divergence of opinion based on all available orders following Garfinkel (2009).

Stock prices, returns, financial statement data, analyst earnings forecasts and

17 See Appendix Table AI for explanations of how this and other variables are derived.
18 Lesmond's zero has been used both as a measure of illiquidity (Bekaert, Harvey and Lundblad (2007)) and as a proxy for firm-specific information impounded in stock prices (Ashbaugh-Skaife, Gassen and LaFond (2006)). Non-zero returns are generated when sufficient value-relevant information arrives in the market and investors trade on such information. Thus an observed zero-return may indicate either absence of significant information signals or high transaction costs that inhibit trading for a given piece of information, or both.

microstructure data are from the China Stock Market and Accounting Research (CSMAR) database, while stock trading data, ownership data and shareholder account data are from WIND. CSMAR and WIND are two major databases widely used in China stock market research.

V. Empirical Results

A. *Descriptive and Summary Statistics*

Table I provides summary statistics for our sample firms. Among the four measures of media coverage, NEWS-ALL has the highest mean value per year, which is not surprising given that this variable is based on number of news reports in 98 newspapers. For a start we provide in Panel B summary statistics of the stock pricing and trading variables by media coverage groupings. Since media coverage is strongly related to firm size and many of the market outcome variables are also related to firm size, we first perform an OLS regression of media coverage on firm size (plus industry and year dummies) and obtain the residuals. The media groups are based on residual or "abnormal" media coverage (i.e. after controlling for firm size, industry and year). Only the results for NEWS-ALL are presented as the results are similar for the other measures of media coverage. First focusing on the stock pricing proxies, it is noted that except for Group 1 (the lowest media coverage group), there is a clear

positive correlation between abnormal media coverage and all of price-to-book ratio, market-to-book ratio and Tobin's Q.[19] Moving on to the empirical measures of stock price crash, we again note that as abnormal media coverage increases, incidence of stock price crashes generally increases, though the correlation is not strongly monotonic, especially for the lowest media coverage group. The next two rows present the results for measures of stock liquidity. Except for the lowest media coverage group, stock liquidity generally increases with abnormal media coverage (note that Lesmond's zero is an inverse measure of liquidity). The last four rows present the results for empirical measures of divergence of opinion. Here an almost monotonic correlation emerges between divergence of opinion and abnormal media coverage (a monotonic correlation is obtained for analyst forecast dispersion). Thus, the preliminary results support the proposition of a positive association between media coverage and our market outcomes of interest.

Table II reports the correlation coefficients between selected variables. Several points are noteworthy. First, the pair-wise correlation coefficient of the four measures of media coverage ranges from 0.3 to 0.74. It appears that they each capture interrelated but slightly different aspects of news coverage. Second, stocks with high (raw) media coverage tend to be associated with high stock turnover, high daily return

19 In the regression analyses we take the natural log of media coverage to allow for possible nonlinearity in the effects of media coverage.

variance, more analyst following, high percentage institutional ownership, and high likelihood of stock price crashes, consistent with the impression obtained in Table I. However, the univariate relationships between media coverage, bid-ask spread and incidence of zero-returns are not clear-cut. Third, large firms tend to have more media coverage, higher stock turnover, lower relative bid-ask spread, fewer incidences of zero-returns, higher daily return variance, more analyst following, and a higher percentage of institutional ownership. We control for firm size in all regressions.

[Insert Table I about here]

[Insert Table II about here]

B. *Determinants of Media Coverage*

We first explore the possible factors influencing media coverage. Such an analysis helps to identify variables that might be endogenously determined with media coverage. In the absence of a well established model for media coverage, several specifications are used. To facilitate interpretation, we take the natural log of (1 plus) the continuous variables.[20]

[Insert Table III about here]

In Table III we present 8 models all with progressively more variables. Model 1 follows Chen et al. (2009) and regresses media coverage on firm size, industry

20 In all analyses that follow, we experiment with all measures of media coverage. The results are generally robust to the different measures. To conserve space and unless otherwise indicated, in all subsequent tables we only report the results for NEWS-ALL.

classification and year dummies. Firm size is significantly and positively associated with media coverage. Model 2 follows Fang and Peress (2009) (henceforth, FP). Since our analyst-related data are only available starting from 2004, the number of observations in Model 2 is more than halved compared to Model 1. The finding that firm size, book-to-market ratio (inverse of MTB) and residual variance are positively associated with media coverage is consistent with FP. However, unlike FP's finding for the US market, we find that analyst following is positively associated with media coverage, suggesting that analyst coverage and media coverage in China complement, rather than substitute for, each other. The difference may reflect differences in the institutional environment: given the relative dearth of corporate information available, journalists in China may rely more on analyst reports than do their counterparts in the US.[21] Unlike FP, we do not find a statistically significant association between media coverage and fraction of individual ownership (inverse measure of shareholder concentration), or between media coverage and analyst forecast dispersion.[22]

Model 3 is obtained by adding stock turnover to Model 2. In view of the significant reduction in sample size when analyst following is included, and to explore the influence of other variables on media coverage, we next delete analyst

[21] Our reading of the news reports reveals that many Chinese newspapers often quote analysts as a source of information and some publish analyst-written articles (e.g. stock analysis and recommendations) on a regular basis.

22 FP find that firms with higher analyst forecast dispersion have more media coverage. In a later section, we find that firms with more media coverage tend to have higher forecast dispersion (i.e. a different direction of influence).

following and forecast dispersion from Model 3 and obtain Model 4 after adding number of registered shareholders at year-end, beta, number of major corporate events during the year, and three dummy variables denoting whether the firm is designated "Special Treatment (ST)", whether it reports a loss for the year, and the stock exchange of listing.[23] Four of the newly added variables are significantly positively associated with media coverage: turnover, number of major corporate events, ST designation, and loss-making. In addition, market-to-book ratio, average daily return in prior year (PAST-RET), beta and place of listing are significantly negatively associated with media coverage.[24]

Model 5 expands Model 4 by including firm age and two dummy variables indicating whether the firm is included in a local market index and whether the firm operates in a regulated industry (banking, telecommunications, and public utilities). Firm age (index membership) is negatively (positively) associated with media coverage at conventional levels. In Model 6 we add three dummy variables that reflect the identity of the controlling shareholder. Relative to companies controlled by private

23 In April 1998 the stock exchanges in China created a "Special Treatment" category to distinguish shares of those companies with financial problems (e.g. net loss for two consecutive years, or other financial abnormalities). The daily price changes of ST shares are restricted to 5% (CSRC (2008)). In 2003 CSRC introduced a new designation called "*ST", which is similar to the ST designation except that an "*ST" firm is no longer given a transitional period during which it must improve its performance to avoid being delisted. We label both "ST" and "*ST" firms as ST.

24 The results are robust to different variable definition/measurement. For example, the results remain qualitatively the same as those reported here when we replace turnover by various measures of abnormal turnover, when we replace daily returns by annual returns, and when we replace residual variance by daily return variance.

parties (the omitted category), companies controlled by local State Asset Management Bureaus (LAMB), companies controlled by Central Government agencies (CENTRALGOV), and companies controlled by local governments (LOCALGOV) are associated with significantly less media coverage.[25] This finding is consistent with anecdotal evidence and allegations that governments at different levels in China tend to discourage media scrutiny of key enterprises under their control.[26]

Model 7 includes the combined effects of ownership characteristics and analyst following on media coverage. All the variables remain statistically significant in the same direction. In addition, percentage institutional ownership is significantly negatively associated with media coverage. The explanatory powers of all model specifications are high (with R-squared ranging from 0.49 to 0.82) compared to an R-squared of 0.24 in FP.

To explore the degree of persistence in media coverage, we add lagged (by one year) media coverage in Model 8. While the variables that have shown consistent statistical significance continue to do so, the coefficient of lagged media coverage is a highly significant 0.25, suggesting that a 1% increase in media coverage in the prior year increases current year media coverage by 0.25% on average. We also estimate an

25 We thank Liping Xu for providing ownership data for the period 2000-2004. We extend the ownership data to cover the more recent years by adapting the method of Chen, Firth and Xu (2009). When we group the companies into privately held companies and State-owned/controlled companies only, the latter category is again associated with significantly less media coverage.

26 One of the most recent cases involves the closing down of a magazine that published criticisms of a Central Government-controlled company (http://cn.wsj.com/big5/20100514/rec150518_ENversion.shtml).

autoregressive equation of monthly media coverage with up to 6 lags (results not tabulated). Depending on the measure of media coverage used, the coefficient of the first (second) lag ranges from 0.4 to 0.58 (from 0.1 to 0.2) and the coefficients of longer lags decline rapidly (to approximately 0.01 for the 6^{th} lag). Taken together, the results suggest some degree of persistence in media coverage.

Our analyses of the determinants of financial media coverage in China reveal two key findings. First, despite some similarities between the US and China in terms of the factors influencing media coverage, there exist important differences, which likely result from differences in the institutional environments. Whether, and to what extent, such differences affect stock pricing and trading is the subject of the subsequent analyses. Second, turnover and residual return variance are found to be positively associated with media coverage. Since some of our later tests hypothesize that these variables are affected by media coverage (amongst other factors), there is a potential endogeneity problem.[27] Our later tests control for such potential endogeneity problems.

C. *Media Coverage, Expected Returns and Trading Volume: Chinese Evidence*

In the US market setting, FP find that stocks of firms with no media coverage have higher expected returns than stocks of firms with high media coverage, and

27 To control for endogeneity, we re-run all regressions using the lagged (by one year) value of turnover, and residual variance. In addition, we perform fixed effects models to take into account possible unobserved heterogeneity. The results remain qualitatively similar to those reported here.

Engelberg and Parsons (2011) find that media coverage stimulates stock trading activity. Using Chinese data, we are able to replicate the key finding in FP of a negative relation between expected returns and media coverage, and the finding in Engelberg and Parsons (2011) of a reliably positive relation between stock trading activity and media coverage. We do not tabulate these results (which are available from the authors upon request) both to conserve space and, more importantly, because these results do not allow us to distinguish between the the asymmetric information resolution role of media coverage and the divergence of opinion effect of media coverage (see previous sections). In the subsections below, we focus on conducting multiple tests designed to discriminate the two explanations.

D. *Media Coverage and Stock Mispricing*

Following prior studies, we use the market-to-book ratios, price-to-book ratios and Tobin's Q, adjusted for the industry-year average, as proxies for mispricing. To mitigate the effects of outliers, we rank the mispricing proxies as well as media coverage and perform Ordered Logistic Regressions using the rank values. We use both contemporaneous and lagged (up to two years) values of coverage to allow for the possibility that both past and current media coverage may affect the probability and level of stock mispricing.[28] We perform the regressions with and without analyst

28 The results using different measures of media coverage (including abnormal media coverage) are qualitatively similar to those reported here.

following and institutional ownership, since the inclusion of these latter variables substantially reduces the sample size. The results are reported in Table IV.

[Insert Table IV about here]

First, we find that the coefficients of contemporaneous media coverage are statistically significant and positive, suggesting that stocks of firms with higher (lower) contemporaneous media coverage tend to be associated with higher (lower) industry-adjusted prices relative to book values. The results for lagged media coverage are less clear-cut. There is some evidence that media coverage in the immediately preceding year is positively associated with stock mispricing, and media coverage two years back is negatively associated with mispricing. Thus it appears that while contemporaneous (and, to a lesser extent, immediately preceding year) media coverage tends to be positively associated with stock mispricing, there is a reversal over longer horizons in the form of a correction (i.e. stock price falls for high coverage firms).

We also find that large firms, firms with intensive stock trading, firms with high average daily returns, older firms, firms with higher ROE, firms designated ST and Loss-making, and firms with high percentage institutional ownership tend to have prices that are high relative to fundamentals. On the other hand, beta, share concentration, percentage of tradable shares, shares with an A-H dual listing and firms

included in a local market index are negatively associated with mispricing. The finding that firms reporting a loss and firms designated as Special Treatment are associated with higher stock prices relative to fundamentals is probably due to the fact that these firms have low book values and/or have accumulated losses. That stocks of firms with intensive stock trading and high average daily returns during the year have higher price-containing ratios is also not surprising, since both active trading and high returns generally reflect or lead to price appreciation and even bubbles (Boehem et al. (2006), Bris, Goetzmann and Zhu (2007), and Mei, Scheinkman and Xiong (2009)).

To mitigate possible omitted variable as well as endogeneity problems and to aid inference of causality, we also perform first-differences estimation. The results in Panel B of Table IV indicate that (change in) media coverage is positively associated with (change in) the level of mispricing. The results for the other explanatory variables are generally consistent with those in Panel A. Thus, the results in this subsection suggest that media coverage is significantly associated with stock mispricing, after controlling for other relevant factors.

E. *Media Coverage and Stock Price Crashes*

If media coverage engenders divergence of opinion among investors and causes stocks to be mispriced, in an informationally efficient market one would expect mispricing to be corrected in the future. This may occur due to informed arbitrage, as

a result of learning (Morris, 1996), or as more public information arrives to confirm or refute previous media reports or prior beliefs. Miller (1977), Chen et al. (2002) and Hong and Stein (2003, 2007) predict that the stocks of companies that are overpriced relative to fundamentals have a higher probability of subsequent stock price crashes. In this subsection we test whether companies with more media coverage are more likely to experience stock price crashes. To facilitate comparability with prior studies, we use the same model specifications as in Chen et al. (2002). Table V reports the results of separately regressing three measures of stock price crashes on preceding year media coverage and other firm-specific variables, including those used in Chen et al. (2002), plus control variables specific to China (e.g. Special Treatment designation).

[Insert Table V about here]

Columns 1-2 in Table V indicate that media coverage is positively associated the likelihood of stock price crash. Thus, stocks of firms with more media coverage in the prior year are predicted to have a higher probability of stock price crashes; for example, a 1% increase in the number of new days (NEWS-DAYSt) is approximately associated with a 7 basis point increase in the probability of a subsequent stock price crash. Consistent with Chen et al. (2002), we find that stocks with higher skewness of returns are associated with a higher probability of subsequent stock price crashes (i.e.

statistically significant and positive coefficient for NCSKEWt). Abnormal trading volume (either measured as detrended stock turnover, DET-TURNt, or as standardized unexplained volume, SUVt) in the prior year, annual raw return (RET-ANNt) in the prior year, prior year market-to-book ratio, and Special Treatment and loss-making designations in the prior year are all statistically positively associated with the probability of a subsequent stock price crash. When the likelihood of stock price crash is computed using Jin and Myers (2006), both measures of media coverage (NEWS-DAYS and NEWS-ALL) are positively associated with subsequent stock price crash (columns 3-4). While prior year market-to-book ratio and Special Treatment and loss-making designations in the prior year continue to be positively associated with the probability of stock price crash, abnormal trading volume now picks up a negative coefficient, as does daily return variance. The negative coefficients for abnormal trading volume and return variance are unexpected.

Columns 5-6 in Table V present the results when we use CRASHFQ to capture the frequency of large negative abnormal returns. Prior-year CRASHFQ and media coverage are positively associated with incidence of subsequent stock price crash at conventional levels of statistical significance.

As an interim summary, therefore, the evidence on the relation between media coverage and stock pricing is consistent with the hypothesis that media coverage

increases divergence of opinion among investors, which, in turn, contributes to mispricing, stock price crashes and hence low future returns. In order to better understand the specific mechanisms driving these results, in the next few subsections we focus on the relation between media coverage and stock trading.

F. *Media Coverage and Bid-ask Spread*

As previously noted, the relation between media coverage and bid-ask spread critically depends on which channel of influence dominates: a positive relation is expected if the divergence of opinion effect dominates the information asymmetry resolution effect, and vice versa. Our baseline regression includes all the important explanatory variables as in Stoll (2000, 2003). We sequentially add other variables to gauge the effects of other factors on the spread. The results appear in Table VI.

[Insert Table VI about here]

Model 1 regresses the natural log of relative bid-ask spread on Stoll's list of important explanatory variables (except for trading pressure) plus a set of dummy variables indicating place of listing, year, industry and loss-making or ST designation. In Model 2 we substitute dollar trading volume by number of shares traded. Model 3 and Model 4 are obtained by adding media coverage to Model 1 and Model 2, respectively. Model 5 is obtained by replacing the other trade activity proxies with stock turnover. Models 6-8 are the result of further adding the annual average of daily

buy-sell ratios (as proxy for trading pressure or order imbalance) and a few more variables that proxy for other aspects of risk (e.g. beta, leverage, market-to-book ratio) and firm's information environment (e.g. analyst following, percentage institutional ownership). The additions of these variables substantially reduce the sample size.

The results in Model 1 through Model 8 reveal a statistically significant positive relation between spread and media coverage. The magnitude of the coefficients of media coverage appears small except when turnover is the proxy of trading activity. In terms of economic signifance, the coefficient of 0.006 in Model 7 (0.028 in Model 8), for example, suggests that a 10% increase in media coverage is on average associated with a 0.06% (0.28%) increase in the relative spread, holding other factors constant. In contrast, a 10% increase in analyst following reduces relative spread by about 0.03% (Models 6-7). Although seemingly low in economic significance, the influence of media coverage should not be underestimated as it is relatively easy to boost the media coverage a firm gets.[29] More significantly, the positive association between media coverage and relative bid-ask spread is consistent with the notion that media coverage induces disagreement among investors, which, in turn, leads to wider spreads. The positive relation between media coverage and bid-ask spread is particularly remarkable given that media coverage leads more active trading and

29 For example, media coverage may be boosted through use of investor relations (IR) firms or by placing advertisements with a media firm (see Solomon (2011), and Gurun and Butler (2011)).

active trading tends to reduce the bid-ask spread. These results suggest that although media coverage is associated with more active stock trading, the intensive trading activity may be the result of more disagreement as opposed to resolution of information asymmetries. To the extent that media coverage is positively related to bid-ask spread (a transaction cost), and higher transaction costs make it more difficult to engage in arbitrage (Chen et al. (2002)), the evidence here is also consistent with our earlier finding of a positive relation between media coverage and mispricing.

We next conduct a battery of additional tests. We first decompose bid-ask spread into a divergence of opinion component following Handa et al. (2005), and an adverse selection (asymmetric information) component following Glosten and Harris (1988). These are separately regressed on the same set of explanatory variables as those in Table VI. Second, following Garfinkel (2009) we compute a direct measure of divergence of opinion using all orders in the CSMAR database. The divergence of opinion component of bid-ask spread may be considered as reflecting actual trading costs, whereas Garfinkel's (2009) divergence of opinion largely reflects investors' divergent beliefs as to firm value (i.e. differential valuation). If the predominant effect of media coverage is to resolve asymmetric information, we would expect a negative association between media coverage and the adverse selection component of bid-ask spread. Conversely, if the predominant effect of media coverage is to engender

divergence of opinion, we would expect a positive association between media coverage and the measures of divergence of opinion.

[Insert Table VII about here]

The results appear in Table VII. Models 1-2 use the Glosten and Harris (1988) adverse selection component of bid-ask spread as the dependent variable whereas Models 3-6 use the Handa et al. (2005) divergence of opinion component of bid-ask spread and Garfinkel's (2009) direct measure of divergence of opinion, respectively, as the dependent variable.[30] The coefficients of media coverge in Models 1-2 are not statistically significant. In contrast, Models 3-6 all reveal a statistically significant and positive association between media coverage and measures of divergence of opinion. Thus, these results are consistent with the notion that media coverage is associated with higher divergence of opinion. The next few subsections discuss some robustness checks.

G. *Media Coverage and Analyst Forecast Characteristics*

Prior research has identified a number of variables that could affect analyst forecast properties, including analyst ability/experience/incentives, analyst portfolio structure/complexity/resources, and the information environment amongst others (Elgers and Lo (1994), and Kini et al. (2009)). In this subsection we focus on the

30Estimating the Handa et al (2005) model produces an estimate of (Vh–Vl), the differential valuation between the high valuation trader and the low valuation trader. We standardize this by the daily average bid-ask midpoint to make this measure comparable to the other two measures. The results are qualitatively similar if the unscaled measure is used. See Appendix Table AI for details.

effects of media coverage on consensus analyst forecast accuracy and dispersion. We include number of analyst following, firm size and institutional ownership to control for the information environment, and market-to-book ratio, beta and volatility to control for forecast difficulty/complexity. Due to data constraints we do not explicitly control for analyst ability/experience and resources. To the extent that these omitted variables are not correlated with media coverage, the regression results are likely to be unbiased.

[Insert Table VIII about here]

Table VIII presents the results of regressing the absolute value of analyst forecast error (difference between actual earnings per share and consensus analyst forecast, scaled by absolute value of consensus earnings forecast)[31] and dispersion separately on media coverage and a set of explanatory variables based on prior literature. We use 2SLS (using the lagged by one year values of media coverage as the instrumental variable) to take into account possible endogeneity between analyst forecast error/dispersion and media coverage[32], and Ordered Logistic Regression to mitigate the effects of outliers.[33] As reported in Panel A, media coverage is significantly

31 The results are qualitatively the same if analyst forecast error is scaled by stock price at year-end.

32 Both analyst forecast error/dispersion and media coverage may be determined by a third common factor or set of factors, e.g. information availability/quality, and/or management characteristics.

33 The problem with outliers can be especially serious when forecast error is scaled by small earnings. To minimize the effects of outliers, each year we rank forecast accuracy and media coverage and assign the firm-observations into 10 portfolios (1 for the smallest in value and 10 for the largest). The assigned portfolio rank is then used in the regression. The results are qualitatively the same when we use raw values of media coverage.

positively associated with analyst forecast errors across all six model specifications, suggesting that media coverage is associated with larger, as opposed to smaller, forecast errors. If forecast error is interpreted as a proxy for information risk, our results would suggest that firms with more media coverage have higher information risk.

Panel B reports the regression results for analyst forecast dispersion. Across all model specifications, media coverage is significantly positively associated with forecast dispersion. While the positive association between proxies for uncertainty (e.g. return volatility and earnings volatility) and forecast dispersion seems consistent with the prior literature as well as intuition, it is not immediately clear what drives the positive association between analyst forecast dispersion and both media coverage and analyst following. It might be that there is greater disagreement among more analysts, but it is not immediately obvious why firms with more media coverage are associated with higher analyst forecast dispersion.[34] We conjecture that analysts have differing precisions of private prior information and/or have differential interpretation of public information, and as more information is made available by the mass media,

34 We obtain qualitatively similar results when we set analyst dispersion to zero if the stock has only one analyst following, and when we set it to missing. Diether et al. (2002) find a positive relation between (residual) analyst coverage and dispersion in analyst forecasts, which they interpret as indicating that there is higher demand for expert opinions when existing information is difficult to interpret (as reflected in high analyst forecast dispersion). In light of this, it is tempting to suggest a similar "demand" based explanation for the positive relation between media coverage and forecast dispersion. We do not find this explanation plausible as our earlier investigation of determinants of media coverage finds no statistically significant relationship between media coverage and analyst forecast dispersion.

disagreement among analysts as well as investors increases (Kim and Verrecchia (1991), and Kandel and Pearson (1995)). The finding of a positive relation between analyst forecast dispersion and media coverage is consistent with the notion in Baker and Wurgler (2007) that dispersion of analysts' earnings forecasts reflect speculative appeal, and the notion that media coverage breeds speculative appeal. Our finding that media coverage is positively related to both trading volume and analyst forecast dispersion is consistent with the evidence in Ajinkya et al. (1991) that stock turnover is a positive function of forecast dispersion, and suggests that both trading volume and analyst forecast dispersion may reflect divergence of opinion induced by media coverage. The finding that media coverage is positively related to analyst forecast dispersion but not forecast accuracy is consistent with Davis, Lohse and Kottemann (1994), who provide experimental evidence suggesting that both relevant and redundant news information makes decision makers more confident, but that forecast accuracy is significantly diminished in both the redundant and non-redundant conditions. Interestingly, Joe (2003), also in an experimental setting, finds that even professionals (auditors) react too strongly to redundant information contained in media coverage.

H. *Event Study Approach*

We next adopt an event study approach to see if divergence of opinion indeed

increases upon the publication of news reports. In view of the finding in Kothari et al. (2009) that favourable (unfavourable) firm-specific news reports result in decreased (increased) cost of capital and stock return volatility, we examine both the effects of the extent of media coverage (irrespective of the nature of the news signal) on divergence of opinion and the effects of different types of news releases on divergence of opinion.

Following Nofsinger (2001), we first categorize the news reports into "good news", "bad news" and "neutral news". This is done by computing the cumulative abnormal return (CAR) from the market-model over a 3-day event window centered on the date of the news report, [-1, 1]. If the CAR is in the top (bottom) 20 percentile of the distribution of a stock's abnormal return during the year, the news report is considered to be good news (bad news); the intermediary observations are considered as neutral news.[35] Next, we examine the change in four measures of divergence of opinion (bid-ask spread, Garfinkel's DIVOP, market-adjusted turnover and order imbalance) during the event window relative to their respective mean values during the comparison period [-200, -10].[36] The results for the whole sample period and for

35 The choice of a 3-day event window allows for news reports being published in response to preceding day stock movements, and possible publication lags (i.e. the news reports reach the market after market is closed). The results are robust to different definitions of the event windows (e.g. [-1, 0] or [0, +1]) and different definitions of the nature of the news reports (e.g. if we use the sign and statistical significance of the firm-specific CAR to determine the nature of the news).

36 We do not use (changes in) analyst forecast dispersion as analyst forecasts are revised infrequently.

odd-number years (for brevity) are shown in Table IX.

[Insert Table IX about here]

Relative bid-ask spread: The first row in Panel A indicates that, for the sample as a whole, relative bid-ask spread increases during news days (irrespective of type of news) compared to non-news days (column 1).[37] The largest increase occurs on "bad news" days (column 2), suggesting that bad news exacerbates divergence of opinion. Bid-ask spread decreases on "good news" days (column 4), consistent with Kothari et al (2009). The increase in bid-ask spread is greater for bad news than for neutral news (column 5). What is significant here is that, even on days with neutral news (which represents the majority of the cases), divergence of opinion among investors (as proxied by bid-ask spread) increases relative to days without any firm-specific news (column 3). This is consistent with the proposition that news reports increase divergence of opinion. Broadly the same pattern is found among the individual years.

Garfinkel's DIVOP: As shown in Panel B, for the whole sample, Garfinkel's DIVOP is higher on news days than on non-news days (column 1). DIVOP on "bad news" days (column 2) and on "neutral news" days (column 3) is significantly higher

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To avoid contaminating the comparison period with other firm-specific news, we delete the days on which there are news reports before computing the comparison period values. The results are robust to different estimation windows.

37 The fact that for the whole sample, all empirical measures of divergence of opinions increase on news releases (irrespective of the type of news) alleviates any concern about possible misclassification of type of news.

relative to their mean values during the comparison period (i.e. the non-news days), and is significantly lower on "good news" days (column 4). The increase in DIVOP on "bad news" days is larger than the increase on "neutral news" days (column 5), which is in turn larger than the increase on "good news" days (column 6). The greatest difference in change of DIVOP is between the "bad news" group and the "good news" group (column 7). The results for the individual years are again broadly similar to the results for the whole sample period.

Market-adjusted stock turnover: Panel C shows that market-adjusted stock turnover significantly increases during news days compared to non-news days.[38] Turnover significantly increases on both "bad news" days (column 2) and "good news" days (column 4), consistent with news events triggering trades (Sarkar and Schwartz (2009)). Somewhat to our surprise, stock trading intensity decreases on days with neutral news, though the effect is relatively small.

Order imbalance: As reported in Panel D, order imbalance increases on news days (column 1). It also increases on days with "neutral news" (column 3) and days with "good news" (column 4). The negative sign for order imbalance on "bad news" days indicates an increase (relative to the comparison period) in seller-initiated trades. The results therefore suggest that investors react to firm-specific news reports,

38 The results (untabulated) for alternative measures of turnover (e.g. raw turnover, 200-day-moving-average adjusted turnover) are qualitatively similar.

sometimes even when the news are just neutral in nature. A possible factor driving the change in order imbalance is that disagreement among investors increases upon the publication of firm-specific news reports (Hong and Stein (2007)).

Overall, therefore, the analyses of changes in empirical measures of divergence of opinion surrounding the publication of firm-specific news reports lend further support to our conclusion that the presence of news (even when they are neutral in nature) increases divergence of opinion among investors, which in turn causes stock trading, widens the bid-ask spread, and contributes to mispricing.

I. *Additional Tests*

It may be argued that apart from the extent of media coverage, the content of the underlying news (good news versus bad news) may also affect the relations examined. To explore this possibility, we replicate the analyses in Table IV through Table VIII by adding the ratio of number of good news events over the sum of good news and bad news events.[39] This variable has a positive coefficient in the mispricing and stock price crash regressions but it is not statistically significant at conventional levels. The coefficient is negative in the bid-ask spread and analyst forecast dispersion regressions, but it is again not statistically significant at conventional levels.

39 Good news and bad news are as defined in the previous section. We obtain qualitatively similar results when the denominator is the total number of news (articles or days, depending on the measure of media coverage used). These results are not tabulated for brevity but are available upon request.

Importantly, adding this new variable does not affect the conclusions reached. The finding is consistent with the event study evidence above and indicates that the relations between media coverage and our market outcomes of interest do not critically depend on the good news versus bad news nature of the underlying news.

In her study of post-earnings announcement drift in the US, Vega (2006) finds that media coverage causes dispersion of beliefs, attracts liquidity (noise) traders, and deters informed traders. She finds no relation between media coverage and probability of informed trading (PIN). We estimate PIN following Easley et al. (1996) amongst others and perform a regression of PIN against media coverage, turnover, bid-ask spread, residual return volatility, and firm size, similar to Table IX, Panel B in Vega (2006). The results (untabulated) indicate no association between media coverage and PIN. We further estimate the relationship between media coverage and parameters of PIN (i.e. arrival rate of liquidity traders and arrival rate of informed traders) as well as other control variables, similar to Table X, Panel B in Vega (2006).[40] We find a significant positive relation between media coverage and the arrival rate of liquidity traders (as well as turnover—consistent with our previous findings), but an insignificant relation between media coverage (or turnover) and the arrival rate of

40 We estimate PIN using microstructure data for stocks listed on the Shenzhen Stock Exchange during the years 2004-2009 (due to data availability). The results are qualitatively similar if PIN is estimated for each stock over monthly, semi-annual or annual intervals.

informed traders. Thus, the evidence suggests that media coverage in China encourages trading, but does not lead to more informed (or information-based) trading. In the US market setting, Fang and Peress (2009) also find that the media effect is not explained by PIN, and is not driven by information asymmetries between informed and uninformed traders.

As an alternative to PIN, we also estimate the annual amount of private information trading (PRIVATE) following Llorente et al. (2002) and Ferreira and Laux (2007). We regress PRIVATE against media coverage and a number of firm-specific variables including firm size, analyst following, institutional ownership, and other control variables. If media coverage changes the ratio of informed to uninformed investors, one would expect a negative relation between media coverage and the amount of private information trading, as media reports serve to convey (perhaps previously private) information to a broader investor base. However, it is also possible that, by making available more (public) information, media coverage may encourage the collection of, and trading on, private information (Ferreira and Laux, 2006). The results (untabulated) indicate no statistically significant association between media coverage and the amount of private information trading. Thus, the result obtained using Llorente et al.'s (2002) measure of private information trading is inconsistent with media coverage increasing the collection of, trading on, or

incorporation of private information into stock prices. To the extent that the collection of, and trading on, private information encourages or enables informed arbitrage which helps to move stock prices toward efficiency, the evidence here suggests the media coverage in China does not guard against mispricing. Quite to the contrary, by engendering/exacerbating divergence of opinion, and possibly also by breeding familiarity and speculation, financial news coverage in China has the unexpected effect of causing stock mispricing and subsequent correction, sometimes in the form of price crashes.

VI. Concluding Remarks

Using data from China, we find evidence consistent with US-based studies regarding the relations between media coverage and expected return and stock trading activity. We further find that media coverage is positively associated with probabilities of stock mispricing and stock price crash. Additional tests conducted to distinguish between two possible explanations of the mechanisms of media influence (the "asymmetric information resolution" hypothesis, and the "divergence of opinion" hypothesis) show that that stocks of firms with more media coverage are associated with larger bid-ask spreads and higher analyst forecast dispersion (but not forecast accuracy). Results using an event study approach show that divergence of opinion

increases on days with firm-specific news. Taken together, these findings are consistent with the hypothesis that media coverage increases disagreement among traders and analysts, and are inconsistent with the alternative hypothesis that media coverage primarily resolves information asymmetry.

Our results may be explained in terms of the fact that in China, State control of both the financial news media and most of the listed firms leads to a lack of media competition and hence "media capture". As a consequence, much of what the financial media publish either contains little useful (i.e. new) firm-specific information, or tends to convey "good news" about the firms. Nonetheless, due to inadequate corporate disclosures, most of the retail investors look to the mass media for their investment advice and information needs. Media reports are differentially interpreted by speculative retail investors (some of whom may become overconfident), as reflected in higher bid-ask spreads and higher analyst forecast dispersion, but not higher forecast accuracy, for high coverage firms. This leads to several interconnected market outcomes. First, the greater divergence of opinion as to the value of firms with high media coverage leads to more intensive (perhaps speculative) trading. Second, divergence of opinion among investors, coupled with strictly binding short-sales constraints and limited alternative investment outlets in China, causes the stock price of high coverage stocks to be pushed (through intensive, speculative trading) to a

level that is high relative to the firms' fundamentals. These stocks on average are associated with lower future returns. As further information arrives and/or as investors learn about the firms' true situation over time, stock mispricing is corrected, sometimes drastically, in the form of stock price crashes. Our body of evidence is strongly indicative of such a link between media coverage, stock trading, and stock pricing.

While we obtain our results from an emerging stock market, they are broadly consistent with the evidence documented for the US market, at least with respect to the relations between media coverage and expected returns and trading volume. Whether the media effects and the mechanism of media influence we document for China are also present in other countries (including but not limited to emerging markets) is an issue we leave to future research.

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Table I: Descriptive statistics

This table reports summary statistics for Chinese A-shares during January 2000 through December 2009. NEWS-HITS is annual number of news articles published about a firm in three national securities newspapers with company name or stock code appearing anywhere. NEWS-HEADLINE is annual number of news articles published about a firm in three national securities newspapers with company name or stock code in the headline or lead paragraph. NEWS-DAYS is number of days each year with news articles published about a firm in three national securities newspapers. NEWS-ALL is annual number of news articles published about a firm in 98 Chinese newspapers. AGE is number of years since listing. SIZE is log of total number of tradable shares outstanding multiplied by share price. CONCENT is proportion of ownership for the top 10 largest shareholders. INSTITUTIONAL is percentage ownership by institutional investors. ANALYST is number of analysts issuing earnings forecasts for the firm during given year. ROE is return to equity. DIVIDEND YIELD is dividend yield. LEVERAGE is the sum of short-term and long-term debts divided by total market capitalization. BETA is market-model beta estimated via ordinary least squares using daily returns in calendar year. TURNOVER is the annual ratio of number of shares traded to number of tradable shares outstanding. BIDASK is the annual average of daily relative spreads (the difference between quoted best ask and quoted best bid, divided by bid-ask mid-point). PE is price-to-earnings ratio. MTB is the sum of the market value of tradable shares and the book value of non-tradable shares, divided by the book value of equity. PB is the ratio of share price to book value of equity per share. Tobin-Q is the market value of tradable shares plus the book value of non-tradable shares, divided by the book value of total assets. NCSKEW is negative coefficient of skewness, calculated by taking the negative of

the third moment of each stock's daily market-model residual returns and dividing it by the cubed standard deviation of daily residual returns. JMCRASH is the difference in the number of positive and negative outliers, defined as residual returns exceeding k standard deviations below and above the mean where k is set to generate critical values of 0.1% in a lognormal distribution. CRASHFQ is the number of negative daily residual returns that exceed 3.09 standard deviations, divided by the total number of trading days per year. LESMOND-ZEROS is proportion of zero-return days in a given year. DIVOP is Garfinkel's (2009) measure of divergence of opinion, calculated as the daily standard deviation (across all orders) of the distance between each order's requested price and the most recent trade price preceding that order. ERROR is absolute value of the difference between actual earnings per share and consensus analyst forecast, scaled by absolute value of consensus earnings forecast. DISPERSION is the standard deviation of analyst earnings forecasts divided by the absolute value of the mean forecast.

Panel A. Summary statistics

Variable	N	Mean	Median	Maximum	Minimum	Std. Dev.
NEWS-HITS	13554	47.33	37	928	0	43.90
NEWS-HEADLINE	13559	15.40	10	622	0	21.35
NEWS-DAYS	13612	51.26	48	280	1	30.69
NEWS-ALL	12535	61.98	54	823	1	50.49
AGE	14534	6.517	6	19	0	4.134
SIZE (LOG)	14477	20.74	20.64	26.68	17.12	1.024
CONCENT (%)	14775	58.21	60.1	101.81	0	16.01
INSTITUTIONAL (%)	9664	18.62	10.03	80.50	0.000	21.03

ANALYST	6274	8.307	5.00	46.00	0.00	7.884
ROE	14764	0.012	0.068	75.91	-250.67	2.380
DIVIDEND YIELD	14515	0.008	0.001	0.243	0.000	0.001
LEVERAGE	14764	0.526	0.493	2.836	0.000	0.342
BETA	13805	1.035	1.061	2.396	-0.191	0.234
TURNOVER	14412	2.624	1.925	67.89	0.01	2.899
BIDASK	13637	0.252	0.224	4.650	0.000	0.135
PE	12627	110.80	48.76	1241.58	0.758	191.79
MTB	14486	1.582	1.303	6.121	0.048	0.859
PB	14005	4.697	3.515	31.881	0.600	4.335

Panel B. Market outcomes by abnormal media coverage groupings (NEWS-ALL)

	All	Group 1 (lowest media coverage)	Group 2	Group 3	Group 4	Group 5 (highest media coverage)
PB	4.626	4.199	3.994	4.267	4.665	6.142
MTB	1.582	1.548	1.506	1.532	1.593	1.733
TOBIN-Q	1.633	1.590	1.545	1.571	1.645	1.818
NCSKEW	-0.893	-1.061	-0.891	-0.875	-0.862	-0.774
JMCRASH	0.004	0.013	0.001	0.001	0.004	0.004
CRASHFQ	0.018	0.021	0.013	0.015	0.017	0.023
TURNOVER	2.669	3.347	2.268	2.405	2.604	2.722
LESMONDZEROS	0.028	0.030	0.030	0.030	0.028	0.026

BIDASK	0.249	0.239	0.247	0.248	0.248	0.260
DIVOP (x 100)	0.566	0.544	0.569	0.561	0.583	0.569
ERROR	0.028	0.014	0.017	0.023	0.041	0.041
DISPERSION	0.047	0.031	0.033	0.042	0.052	0.076

Table II: Pearson correlation coefficients

This table reports correlation coefficients of selected firm-level variables for Chinese A-shares during January 2000 through December 2009. NEWS-ALL is annual number of news articles published about a firm in 98 Chinese newspapers. NEWS-DAYS is number of days each year with news articles published about a firm in three national securities newspapers. NEWS-HITS is annual number of news articles published about a firm in three national securities newspapers with company name or stock code appearing anywhere. NEWS-HEADLINE is annual number of news articles published about a firm in three national securities newspapers with company name or stock code in the headline or lead paragraph. TURNOVER is the annual ratio of number of shares traded to number of tradable shares outstanding. BIDASK is the annual average of daily relative spreads (the difference between quoted best ask and quoted best bid, divided by bid-ask mid-point). LESMOND-ZEROS is proportion of zero-return days in a given year. SIZE is natural log of total number of tradable shares outstanding multiplied by share price. DRET-VAR is daily return variance. MTB is the sum of the market value of tradable shares and the book value of non-tradable shares, divided by the book value of equity. ANALYST is number of analysts issuing earnings forecasts for the firm during given year. INSTITUTIONAL is percentage ownership by institutional investors. CRASHFQ is the number of negative daily residual returns that exceed 3.09 standard deviations, divided by the total number of trading days per year. NCSKEW is negative coefficient of skewness, calculated by taking the negative of the third moment of each stock's daily market-model residual returns and dividing it by the cubed standard deviation of daily residual returns.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
NEWS-ALL	1												
NEWS-DAYS	0.66[c]	1											
NEWS-HEADLINE	0.30[c]	0.32[c]	1										
NEWS-HITS	0.63[c]	0.74[c]	0.47[c]	1									
TURNOVER	0.37[c]	0.13[c]	0.09[c]	0.17[c]	1								
BIDASK	-0.03[c]	0.06[c]	-0.20[c]	0.01[a]	-0.27[c]	1							
LESMOND-ZEROS	-0.07[c]	0.03[c]	-0.14[c]	-0.03[c]	-0.37[c]	0.45[c]	1						
SIZE	0.24[c]	0.21[c]	0.40[c]	0.27[c]	0.03[c]	-0.54[c]	-0.28[c]	1					
DRET-VAR	0.33[c]	0.27[c]	0.16[c]	0.31[c]	0.58[c]	-0.13[c]	-0.35[c]	0.15[c]	1				
MTB	-0.01[b]	-0.01[c]	0.01[c]	-0.01	0.02[b]	0.01[b]	-0.02[c]	-0.00	0.00	1			
ANALYST	0.39[c]	0.32[c]	0.37[c]	0.34[c]	0.03[c]	-0.41[c]	-0.24[c]	0.53[c]	0.00	0.01	1		
INSTITUTIONAL	0.34[c]	0.20[c]	0.25[c]	0.31[c]	0.04[c]	-0.29[c]	-0.34[c]	0.55[c]	0.13[c]	0.01	0.49[c]	1	
CRASHFQ	0.15[c]	0.05[c]	0.07[c]	0.10[c]	0.42[c]	-0.00	-0.24[c]	-0.00	0.58[c]	0.05[c]	0.03[b]	0.01	1
NCSKEW	-0.02[c]	0.03[c]	-0.04[c]	0.04[c]	-0.18[c]	0.12[c]	0.03[c]	0.00	-0.47	0.01	-0.05[c]	0.02[b]	-0.02[c]

[c], [b], [a] denote significance at the 1%, 5% and 10% levels.

Table III: Determinants of media coverage

This table reports regression results on the determinants of media coverage. The dependent variable is the natural log of (1 plus) NEWS-ALL, defined as the annual number of news articles published about a firm in 98 Chinese newspapers. SIZE is total number of tradable shares outstanding multiplied by share price. MTB is the sum of the market value of tradable shares and the book value of non-tradable shares, divided by the book value of equity. TURNOVER is the ratio of number of shares traded to number of tradable shares outstanding. SHAREHOLDERS is total number of registered shareholders at year-end. CONCENT is proportion of ownership for the top 10 largest shareholders. INSTITUTIONAL is percentage ownership by institutional investors. DISPERSION is the standard deviation of analyst earnings forecasts divided by the absolute value of the mean forecast. LOGANALYST is natural log of (1 plus) the number of analysts issuing earnings forecasts for the firm during given year. IV is the residual stock return from a market-model regression based on daily data. ABS-PAST-RET is absolute value of average daily return in past year. PAST-RET is average daily return in the past year. BETA is market-model beta estimated via ordinary least squares using daily returns in calendar year. MAJOREVENTS is number of major corporate events (secondary equity offering, rights issue, restructuring, mergers and acquisitions, etc.) during the year. ST is a dummy variable coded 1 if the firm is flagged as Special Treatment, and zero otherwise. LOSS is a dummy variable coded 1 if the firm reports a loss for the current year, and zero otherwise. EXCHANGE is a dummy variable coded 1 if the firm is listed in Shanghai (Shenzhen) Stock Exchange. AGE is number of years since listing. INDEX is a dummy variable coded 1 if the firm belongs to a major local stock market index, and zero otherwise. REGULATED is a dummy variable coded 1 if the firm belongs to a regulated industry (banking, telecommunications, public utilities), and zero otherwise. LAMB is a dummy variable coded 1 if the largest shareholder is a local State Asset Management Bureau, and zero otherwise. CENTRALGOV is a dummy variable coded 1 if the largest shareholder is the Central Government or a Central Government agency, and zero otherwise. LOCALGOV is a dummy variable coded 1 if the largest shareholder is the local government, and zero otherwise. NEWS-ALL_L1 is NEWS-ALL lagged by one year T-test statistics (in brackets) are robust to heteroskedasticity and clustering by firm. Stock exchange, regulated industry, membership in stock market index, industry and year dummies are included but not reported.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
SIZE	0.19	0.23	0.25	0.26	0.26	0.26	0.27	0.2
	(19.27)	(20)	(19.85)	(24.71)	(24.86)	(25.47)	(17.13)	(15.24)
MTB (x 100)		-0.11	-0.08	-0.057	-0.057	-0.07	-0.11	-0.063
		(-3.05)	(-2.34)	(-3.21)	(-3.33)	(-4.03)	(-3.46)	(-2.34)
TURNOVER			0.08	0.11	0.073	0.07	0.1	0.08
			(5.18)	(10.16)	(6.52)	(6.33)	(6.53)	(6.07)
SHAREHOLDERS				-0.12	0.04	0.08	0.33	0.29
				(-1.26)	(0.49)	(0.94)	(2.63)	(2.67)
CONCENT		-0.004	0.018	0.11	0.065	0.08	0.12	0.009
(x 10)		(-0.13)	(0.62)	(5.39)	(3.26)	(3.89)	(0.46)	(0.41)
INSTITUTIONAL							-0.3	-0.027
							(-5.1)	(-4.89)
DISPERSION		0.13	0.13				0.1	0.067
		(1.2)	(1.21)				(1.09)	(0.79)
LOGANALYST		0.09	0.08				0.08	0.07
		(8.62)	(7.94)				(8.09)	(8.11)
IV		0.23	0.2	0.12	0.18	0.18	0.18	0.19
		(15.97)	(11.35)	(10.84)	(14.73)	(14.89)	(10.09)	(12.27)
ABS-PAST-RET		4.96	4.33	-0.88	-1.81	-1.53	2.88	-3.38
		(1.34)	(1.17)	(-0.36)	(-0.73)	(-0.62)	(0.92)	(-1.11)
PAST-RET		-5.03	-6.4	-9.48	-8.11	-8.1	-10.34	-10.51
		(-1.74)	(-2.23)	(-4.6)	(-3.94)	(-3.91)	(-4.06)	(-4.2)
BETA				-0.13	-0.13	-0.13	-0.31	-0.29
				(-5.69)	(-5.99)	(-5.94)	(-9.45)	(-10.14)
MAJOREVENTS				0.3	0.3	0.3	0.31	0.31
				(28.81)	(29.61)	(29.02)	(23.43)	(24.94)
ST				0.29	0.3	0.3	0.2	0.1
				(16.87)	(17.08)	(16.56)	(6.17)	(3.42)
LOSS				0.096	0.094	0.09	0.12	0.086
				(8.57)	(8.23)	(8.11)	(6.6)	(5.32)
AGE					-0.062	-0.057	-0.075	-0.06
					(-7.37)	(-6.71)	(-7.47)	(-7.56)
LAMB						-0.07	-0.07	-0.043
						(-5.74)	(-4.65)	(-3.57)
CENTRALGOV						-0.055	-0.043	-0.027
						(-3.19)	(-2.19)	(-1.77)
LOCALGOV						-0.082	-0.05	-0.029
						(-5.63)	(-2.5)	(-1.78)
NEWS-ALL_L1								0.25
								(10.51)
Adj-R^2	0.73	0.49	0.5	0.81	0.81	0.82	0.65	0.69
N	12380	5040	5040	11589	11234	11218	4811	**4811**

Table IV: Media coverage and stock mispricing

This table reports results of regressing firm-level variables on measures of stock mispricing. ABN_MTB is industry-mean adjusted market-to-book ratio. ABN-PB is industry-mean adjusted price-to-book ratio. ABN_Q is industry-mean adjusted Tobin-Q. NEWS-ALL_L1 (NEWS-ALL_L2) is NEWS-ALL lagged by one year (two years). DAILY-RET is average daily return. TRADABLE is ratio of tradable shares to total shares. ROE is return on equity. LEVERAGE is the sum of short-term and long-term debts divided by total market capitalization. LOGANALYST is natural log of (1 plus) the number of analysts issuing earnings forecasts for the firm during given year. AB is a dummy variable coded 1 if the firm has a dual A-share and B-share listing, and zero otherwise. AH is a dummy variable coded 1 if the firm has a dual A-share and H-share listing, and zero otherwise. Other variables are as defined in Table III. In Panel A, exchange, industry and year dummies are included but not reported. T-test statistics (in brackets) are robust to heteroskedasticity and clustering by firm.

Panel A: Ordered Logistic Regression results

	ABN_PB	ABN_MTB	ABN_Q	ABN_PB	ABN_MTB	ABN_Q
NEWS-ALL	0.07	0.04	0.05	0.07	0.03	0.05
	(9.24)	(5.39)	(5.94)	(5.74)	(2.43)	(3.66)
NEWS-ALL_L1	0.04	0.00	0.01	0.04	-0.01	-0.02
	(4.65)	(1.19)	(1.14)	(3.26)	(-1.50)	(-1.35)
NEWS-ALL_L2	-0.01	-0.01	-0.01	-0.03	-0.03	-0.02
	(-1.96)	(-1.81)	(-1.12)	(-3.13)	(-2.97)	(-1.71)
SIZE	0.15	0.19	0.13	0.16	0.14	0.11
	(3.07)	(4.00)	(2.62)	(3.52)	(2.85)	(2.97)
BETA	-1.63	-1.53	-1.43	-1.03	-0.81	-0.49
	(-16.61)	(-16.11)	(-13.12)	(-6.70)	(-5.35)	(-2.81)
TURNOVER	0.15	0.11	0.11	0.19	0.20	0.17
	(8.60)	(6.54)	(5.47)	(7.97)	(8.37)	(5.95)
AGE	0.07	0.04	0.04	0.03	0.01	0.02
	(11.30)	(6.31)	(5.84)	(4.50)	(2.04)	(2.35)
CONCENT	-0.01	-0.00	-0.00	-0.01	-0.01	-0.01
	(-7.17)	(-5.05)	(-4.86)	(-5.50)	(-5.43)	(-4.44)
TRADABLE	-0.02	-0.02	0.00	-0.01	-0.02	0.00
	(-14.00)	(-14.05)	(5.04)	(-9.16)	(-12.47)	(2.52)
ROE	-0.00	-0.00	-0.00	0.01	-0.00	-0.00
	(-0.50)	(-1.56)	(-2.14)	(5.13)	(-0.50)	(-2.91)
VROE	0.00	-0.00	0.00	0.00	-0.00	-0.00
	(7.46)	(-0.14)	(0.79)	(3.66)	(-0.75)	(-1.86)
LEVERAGE	0.00	0.00	-0.00	-0.00	-0.00	-0.01
	(1.20)	(1.17)	(-0.69)	(-0.17)	(-1.77)	(-1.81)
LOSS	0.78	0.20	0.35	1.07	0.13	0.12
	(13.17	(3.73)	(5.63)	(8.23)	(1.25)	(1.07)
ST	0.93	0.58	0.71	1.50	1.02	0.95
	(11.28)	(8.29)	(8.94)	(8.79)	(6.54)	(5.47)
LOGANALYST				0.01	0.09	-0.02
				(0.52)	(2.58)	(-0.57)
INSTITUTIONAL				0.02	0.02	0.02
				(12.51)	(15.76)	(12.75)
AB	0.52	0.12	-1.92	0.02	-0.44	-1.95
	(6.26)	(1.63)	(-20.68)	(12.02)	(-3.73)	(-13.98)
AH	-0.27	-1.09	-2.31	-0.44	-1.26	-2.01
	(-2.30)	(-9.47)	(-16.09)	(-3.11)	(-8.95)	(-11.86)

INDEX	-0.38	-0.37	-0.44	-0.30	-0.15	-0.26
	(-6.23)	(-6.33)	(-6.50)	(-3.67)	(-1.80)	(-2.80)
EXCHANGE	0.11	0.07	-0.00	0.04	-0.06	-0.08
	(2.96)	(1.98)	(-0.12)	(0.80)	(-1.27)	(-1.34)
Pseudo R^2	0.06	0.04	0.06	0.06	0.07	0.05
N	8771	9040	6848	4668	4708	3573

Panel B. First-differences estimation

	ΔABN_PB	ΔABN_MTB	ΔABN_Q	ΔABN_PB	ΔABN_MTB	ΔABN_Q
NEWS-ALL	0.12	0.07	0.07	0.14	0.06	0.07
	(12.45)	(6.66)	(6.33)	(8.03)	(3.02)	(6.33)
NEWS-ALL_L1	0.05	-0.01	-0.00	0.07	-0.03	-0.03
	(5.48)	(-1.25)	(-0.51)	(4.71)	(-2.20)	(-1.49)
SIZE	2.62	3.07	2.01	2.72	3.24	2.45
	(29.97)	(23.71)	(8.09)	(21.11)	(20.63)	(13.65)
BETA	-0.67	-0.55	-0.16	-0.22	0.48	0.84
	(-5.88)	(-4.42)	(-1.27)	(-1.10)	(2.01)	(2.58)
TURNOVER	0.01	0.07	0.08	-0.02	0.03	0.02
	(0.53)	(3.58)	(4.66)	(-0.99)	(1.19)	(0.73)
CONCEN	0.00	0.00	0.01	0.00	-0.00	-0.00
	(0.52)	(0.67)	(1.42)	(0.29)	(-0.26)	(-0.48)
TRADABLE	0.00	-0.00	0.03	0.00	-0.01	0.02
	(0.97)	(-0.94)	(3.45)	(0.06)	(-2.84)	(4.74)
ROE	-0.00	-0.00	-0.00	0.00	-0.00	-0.00
	(-2.83)	(-2.80)	(-2.74)	(0.55)	(-0.05)	(-0.02)
VROE	-0.00	-0.00	0.00	0.00	0.00	0.00
	(-2.38)	(-1.70)	(0.32)	(0.85)	(4.00)	(0.34)
LEVERAGE	0.00	0.00	-0.00	0.00	-0.00	-0.00
	(3.08)	(2.74)	(-1.48)	(0.26)	(-1.00)	(-0.22)
LOSS	0.48	0.11	0.24	0.61	0.13	0.09
	(6.57)	(1.80)	(3.29)	(3.46)	(0.95)	(0.37)
ST	-0.04	-0.03	0.11	0.79	-0.04	0.08
	(-0.34)	(-0.30)	(0.73)	(2.69)	(-0.14)	(0.20)
LOGANALYST				0.31	0.23	0.15
				(5.49)	(3.83)	(1.88)
INSTITUTIONAL				0.00	0.02	0.02
				(1.62)	(7.28)	(5.13)
Centered R^2	0.04	0.01	0.08	0.05	0.05	0.06
N	9535	8663	4905	3321	3337	1871

Table V: Media coverage and stock price crashes

This table presents the results of regressing firm-level variables on measures of incidence of stock price crash. NCSKEW is the negative of (the sample analog to) the third moment of a stock's daily market-model residual returns divided by (the sample analog to) the cubed standard deviation of daily residual returns. JMCRASH is the difference in the number of positive and negative outliers, defined as residual returns exceeding k standard deviations below and above the mean where k is set to generate critical values of 0.1% in a lognormal distribution. CRASHFQ is the number of negative daily residual returns that exceed 3.09 standard deviations, divided by the total number of trading days per year. NEWS-ALL is the natural log of (1 plus) the annual number of news articles published about a firm in 98 Chinese newspapers. NEWS-DAYS is the natural log of (1 plus) the number of days each year with news articles published about a firm in three national securities newspapers. DET-TURN is 200-day-moving-average adjusted stock turnover. SUV is standardized prediction error from a regression of daily turnover on the absolute value of returns for the firm, computed according to Garfinkel (2009). RET-VAR is the annual average of daily return variance. KURTOSIS is the kurtosis of the firm-specific daily return over the year. RET-ANN is annual return. Other variables are as defined in Table III. T-test statistics (in brackets) are robust to heteroskedasticity and clustering by firm.

	NCSKEW t+1	NCSKEW t+1	JMCRASH t+1	JMCRASH t+1	CRASHFQ t+1	CRASHFQ t+1
$NCSKEW_t$	0.02	0.03				
	(2.38)	(2.50)				
$JMCRASH_t$			0.01	0.01		
			(0.55)	(0.48)		
CRASHFQt					0.18	0.18
					(11.73)	(11.74)
$NEWS\text{-}ALL_t$		0.04		0.001		0.07
		(3.07)		(2.98)		(3.01)
$NEWS\text{-}DAYS_t$	0.07		0.001		0.07	
	(3.02)		(3.20)		(3.06)	
$DET\text{-}TURN_t$		0.06		-0.004		-0.06
		(1.83)		(-4.55)		(-1.67)
SUV_t	0.08		-0.003		-0.04	
	(3.35)		(-4.93)		(-1.77)	
$RET\text{-}VAR_t$	-52.63	-49.25	-8.56	-8.39	-14.26	-31.17
	(-1.93)	(-1.85)	(-10.01)	(-9.77)	(-0.52)	(1.03)
$KURTOSIS_t$			0.0001	0.000		
			(2.87)	(2.73)		
$SIZE_t$	0.02	0.02	0.006	0.006	-0.18	-0.18
	(1.45)	(1.97)	(2.02)	(1.98)	(-12.61)	(-12.54)
$RET\text{-}ANN_t$	0.05	0.05	-0.0007	-0.0007	0.06	0.06
	(2.80)	(2.85)	(-1.83)	(-1.98)	(4.10)	(4.23)
$RET\text{-}ANN_{t-1}$			0.000	0.000	0.03	0.03
			(0.59)	(0.16)	(2.61)	(2.52)
$RET\text{-}ANN_{t-2}$			-0.004	-0.004	0.05	0.05
			(-0.90)	(-1.01)	(2.52)	(2.35)

MTB (X100)	0.08	0.008	0.01	0.01	0.06	0.06
	(3.92)	(3.93)	(58.28)	(58.17)	(6.75)	(6.80)
ST_t	0.14	0.14	0.006	0.006	0.10	0.10
	(3.59)	(3.68)	(5.49)	(5.84)	(3.46)	(3.47)
$LOSS_t$	0.21	0.20	0.002	0.002	0.36	0.35
	(7.70)	(7.69)	(3.05)	(3.35)	(14.73)	(14.71)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Adj-R^2	0.10	0.09	0.27	0.28	0.38	0.38
N	10841	10896	9353	9320	5870	5846

Table VI: Media coverage and relative bid-ask spread

This table presents the results of regressing the natural log of annual average relative spread on firm-level variables. NEWS-ALL is the natural log of (1 plus) the annual number of news articles published about a firm in 98 Chinese newspapers. DOLLARVOL is annual average of daily local currency denominated amount of shares traded. SHARETRADED is annual average of daily number of share traded. TRANSACTIONS is annual average of daily number of buy-sell transactions. PRICE is average closing stock price during the year. RET-VAR is annual average of daily return variance. BUYSELLRATIO is annual average of daily ratios of buyer-initiated transactions to seller-initiated transactions. Other variables are as defined in Table III. Exchange, industry and year dummies are included but not reported. T-test statistics (in brackets) are robust to heteroskedasticity and clustering by firm.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
NEWS-ALL			0.005	0.003	0.029	0.006	0.006	0.028
			(4.20)	(2.59)	(4.84)	(2.55)	(2.15)	(2.30)
DOLLARVOL	-0.002		-0.003			-0.01		
	(-1.13)		(-1.59)			(-3.87)		
SHARETRADED		0.02		0.02			0.03	
		(11.35)		(11.14)			(7.43)	
TRANSACTIONS	-0.11	-0.15	-0.11	-0.15		-0.09	-0.15	
	(-25.45)	(-31.75)	(-25.23)	(-31.64)		(-17.74)	(-25.78)	
TURNOVER					-0.325			-0.329
					(-33.83)			(-18.97)
SIZE	0.007	-0.004	0.007	-0.005	-0.23	0.01	-0.005	-0.243
	(4.75)	(-3.20)	(4.30)	(-3.42)	(-44.20)	(4.98)	(-2.19)	(-24.51)
PRICE	-0.04	-0.02	-0.04	-0.02	-0.15	-0.03	-0.02	-0.154
	(-29.40)	(-16.48)	(-29.74)	(-16.86)	(-18.04)	(-15.60)	(-8.15)	(-13.20)
RET-VAR	0.032	0.031	0.032	0.030	0.10	0.025	0.024	0.191
	(13.01)	(12.65)	(12.79)	(12.41)	(6.85)	(6.96)	(5.71)	(8.71)
BUYSELLRATIO						-0.015	-0.071	0.259
						(-0.36)	(-2.41)	(1.36)
BETA						-0.012	-0.006	-0.233
						(-1.64)	(-1.11)	(-6.60)
MTB						0.001	0.009	-0.011
						(0.44)	(2.05)	(-0.68)
LEVERAGE						0.000	0.000	-0.000
(X 100)						(0.33)	(0.93)	(-0.53)
LOGANALYST						-0.003	-0.003	-0.017
						(-2.35)	(-2.39)	(-3.06)
INSTITUTIONAL						-0.002	-0.003	0.001
						(-3.15)	(-3.77)	(6.45)
ST	0.04	0.03	0.04	0.03	0.13	0.007	0.003	0.043
	(15.45)	(14.21)	(14.74)	(13.70)	(15.57)	(1.57)	(0.78)	(2.12)
LOSS	0.02	0.02	0.02	0.02	0.07	0.02	0.02	0.078
	(13.60)	(13.18)	(13.34)	(12.99)	(12.93)	(7.08)	(6.76)	(5.53)
Adj-R^2	0.74	0.75	0.74	0.75	0.80	0.80	0.81	0.82
N	12438	12438	12373	12373	9398	2445	2445	2433

Table VII: Media coverage and components of bid-ask spread

This table presents the results of regressing components of annual average relative spread on firm-level variables. GH Adverse Selection is Glosten and Harris (1988) adverse selection component of bid-ask spread. HANDA-DIVOP is Handa et al. (2005)'s divergence of opinion component of bid-ask spread. GARFINKEL-DIVOP is Garfinkel's (2009) divergence of opinion component of bid-ask spread. Other variables are as defined in Table VIII. Exchange, industry and year dummies are included but not reported. T-test statistics (in brackets) are robust to heteroskedasticity and clustering by firm.

	(1) GH Adverse Selection	(2) GH Adverse Selection	(3) HANDA-DIVOP	(4) HANDA-DIVOP	(5) GARFINKEL-DIVOP	(6) GARFINKEL-DIVOP
NEWS-ALL	0.000	-0.000	0.003	0.005	0.0001	0.0002
	(0.97)	(-0.49)	(6.95)	(3.90)	(1.88)	(3.11)
SHARETRADED	0.005	0.003	-0.01	-0.01	0.001	0.001
	(6.88)	(3.07)	(-9.94)	(-5.02)	(12.80)	(9.21)
TRANSACTIONS	-0.06	-0.05	0.00	-0.005	-0.003	-0.004
	(-40.53)	(-33.75)	(0.36)	(-2.11)	(-28.85)	(-23.05)
SIZE	-0.003	-0.003	0.009	0.01	-0.000	-0.0001
	(-6.56)	(-5.57)	(9.23)	(5.66)	(-4.24)	(-2.60)
PRICE	0.008	0.003	0.01	0.01	-0.001	-0.0009
	(12.76)	(4.83)	(17.82)	(7.97)	(-22.35)	(-11.35)
RET_VAR	0.02	0.02	0.007	0.008	0.001	0.0003
	(23.40)	(18.64)	(13.67)	(4.45)	(11.04)	(2.81)
BUYSELLRATIO		0.08		-0.003		-0.004
		(7.09)		(-0.26)		(-5.83)
BETA		-0.002		-0.007		0.000
		(-1.15)		(-2.81)		(0.70)
MTB		0.002		0.01		0.000
		(0.89)		(3.26)		(1.90)
LEVERAGE		0.002		-0.000		0.000
(X 100)		(0.19)		(-0.60)		(1.26)
LOGANALYST		0.000		-0.000		-0.0001
		(0.19)		(-0.51)		(-4.12)
INSTITUTIONAL		0.000		-0.000		-0.0001
		(2.94)		(-1.69)		(-6.20)
ST	0.003	0.002	0.004	-0.001	0.0008	0.0001
	(3.66)	(1.12)	(7.28)	(-0.68)	(8.44)	(1.01)
LOSS	0.006	-0.000	0.001	0.001	0.0005	0.0008
	(1.06)	(0.73)	(3.06)	(1.71)	(7.98)	(7.35)
Adj-R^2	0.65	0.86	0.49	0.54	0.23	0.81
N	12373	2445	12373	2445	12373	2445

Table VIII: Media coverage and analyst forecast characteristics

This table presents the results of regressing analyst forecast characteristics on firm-level variables. In both panels, models 1-3 are 2SLS and models 4-6 are Ordered Logistic regressions. ERROR is absolute value of the difference between actual earnings per share and consensus analyst forecast, scaled by absolute value of consensus earnings forecast. NEWS-HITS is the natural log of (1 plus) the annual number of news articles published about a firm in three national securities newspapers with company name or stock code appearing anywhere. NEWS-ALL is the natural log of (1 plus) the annual number of news articles published about a firm in 98 Chinese newspapers. NEWS-DAYS is the natural log of (1 plus) the number of days each year with news articles published about a firm in three national securities newspapers. DISPERSION is the standard deviation of analyst earnings forecasts divided by the absolute value of the mean forecast. LOGRET-VAR is natural log of annual average of daily return variance. LOGVROE is natural log of variance of return on equity during last 5 years. Other variables are as defined in Table III. Industry and year dummies are included but not reported. T-test statistics (in brackets) are robust to heteroskedasticity and clustering by firm.

Panel A: Dependent variable is ERROR

	(1)	(2)	(3)	(4)	(5)	(6)
NEWS-HITS	0.40			0.02		
	(3.13)			(2.21)		
NEWS-ALL		1.00			0.02	
		(4.59)			(2.14)	
NEWS-DAYS			1.15			0.04
			(6.45)			(2.62)
LOGANALYST	-0.66	-0.70	-0.79	-0.83	-0.83	-0.82
	(-15.16)	(-16.53)	(-16.98)	(-18.08)	(-18.29)	(-18.29)
INSTITUTIONAL	-0.20	-0.16	-0.12	-0.19	-0.18	-0.18
	(-7.85)	(-6.29)	(-4.51)	(-6.39)	(-6.19)	(-6.08)
LOGRET-VAR	0.77	0.53	0.48	0.74	0.74	0.76
	(6.79)	(4.26)	(4.25)	(8.10)	(8.06)	(8.55)
LOGVROE	0.05	0.03	0.02	0.06	0.06	0.06
	(3.81)	(2.44)	(1.46)	(4.25)	(4.15)	(4.22)
BETA	-0.30	0.06	0.07	-0.14	-0.12	-0.13
	(-1.81)	(0.32)	(0.42)	(0.93)	(-0.79)	(-0.84)
SIZE	0.08	-0.03	-0.14	0.25	0.25	0.23
	(1.69)	(-0.59)	(-2.18)	(6.37)	(6.31)	(5.38)
MTB	-0.38	-0.28	-0.23	-0.41	-0.41	-0.40
	(-3.51)	(-2.64)	(-2.19)	(-2.78)	(-2.80)	(-2.70)
Adj-R^2	0.19	0.18	0.17	0.04	0.04	0.04
(Pseudo R^2)						
Obs.	4790	4803	4803	4954	4955	4955

Panel B: Dependent variable is DISPERSION

	(1)	(2)	(3)	(4)	(5)	(6)
NEWS-HITS	0.02			0.06		
	(3.74)			(4.49)		
NEWS-ALL		0.02			0.02	
		(1.61)			(1.42)	
NEWS-DAYS			0.02			0.03
			(1.90)			(2.31)
LOGANALYST	0.007	0.009	0.007	0.47	0.51	0.49
	(2.91)	(3.34)	(2.60)	(9.12)	(9.84)	(9.26)
INSTITUTIONAL	-0.003	-0.002	-0.002	0.01	0.02	0.02
	(-2.17)	(-1.73)	(-1.45)	(0.76)	(0.94)	(0.88)
LOGRET-VAR	0.03	0.04	0.04	0.32	0.39	0.37
	(4.08)	(3.85)	(4.23)	(2.84)	(3.21)	(3.14)
LOGVROE	0.003	0.003	0.003	0.12	0.12	0.12
	(3.94)	(3.73)	(3.70)	(7.66)	(7.91)	(7.91)
BETA	-0.03	-0.03	-0.03	0.005	-0.02	-0.04
	(-2.64)	(-2.27)	(-2.63)	(0.02)	(-0.13)	(-0.21)
SIZE	0.003	0.004	0.004	0.12	0.17	0.15
	(1.43)	(1.20)	(1.03)	(2.52)	(3.38)	(3.15)
MTB	-0.00	-0.00	0.00	-0.02	-0.02	-0.03
	(-0.01)	(-0.00)	(0.05)	(-0.44)	(-0.56)	(-0.76)
Adj-R^2	0.10	0.09	0.09	0.03	0.03	0.03
(Pseudo R^2)						
N	3791	3801	3801	3791	3801	3801

Table IX: Change in divergence of opinion surrounding firm-specific news releases

This table presents changes in measures of divergence of opinion in a 3-day event window [-1, 1] centered on the publication of firm-specific news. Change in Divergence of Opinion is the change in the specific measure of divergence of opinion during the 3-day event window (news days) relative to its comparison period mean value (the non-news days). Good News is a news report that places the cumulative abnormal return over the 3-day event window in the top 20 percentile of the distribution of a stock's abnormal return during the year. Bad News is a news report that places the cumulative abnormal return over the 3-day event window in the bottom 20 percentile of the distribution of a stock's abnormal return during the year. The intermediate observations are classified as Neutral News. BIDASK is the daily average relative spread. GARFINKEL-DIVOP is Garfinkel's (2009) measure of divergence of opinion. MARKET-ADJUSTED is the firm-specific turnover (ratio of number of shares traded to number of tradable shares outstanding) minus the marketwide turnover ratio. BUYSELLRATIO is daily average ratio of buyer-initiated transactions to seller-initiated transactions. The number of observations (N) appears in parentheses. The t-statistic for the null hypothesis appears in square brackets. Untabulated tests of equality of variances reject equal variances, hence the t-statistics for test for difference in means are based on unequal variances. Results based on Signed Rank test are qualitatively similar and hence omitted.

	Change in Divergence of Opinion				Test for difference in population means between groups		
	T-statistic for H_0: $D_{news} - D_{nonews} <= 0$				T-statistic for H_0: Difference between groups <=0		
	All News	Bad News	Neutral News	Good News	Bad News – Neutral News	Neutral News – Good News	Bad News – Good News
				Panel A: BIDASK			
All years (2000-2009)	0.01 (N=602991) [16.01]	0.03 (N=124157) [16.09]	0.01 (N=339552) [14.78]	-0.08 (N=139282) [-5.71]	0.02 [10.91]	0.01 [11.37]	0.04 [16.51]
2001	0.08 (N=30220) [29.14]	0.15 (N=4073) [13.60]	0.08 (N=21284) [25.69]	0.05 (N=4863) [7.26]	0.10 [7.45]	0.03 [4.40]	0.13 [9.01]
2003	0.03 (N=66589) [58.34]	0.03 (N=15117) [33.96]	0.03 (N=36236) [54.77]	0.00 (N=15221) [0.40]	-0.001 [-1.05]	0.03 [33.11]	0.03 [25.85]
2005	0.001 (N=80070) [1.86	0.01 (N=16294) [14.21]	0.003 (N=44666) [6.29]	-0.02 (N=19110) [-20.12]	0.01 [10.04]	0.02 [20.49]	0.03 [23.69]
2007	-0.04 (N=76898) [-126.42]	-0.04 (N=17856) [-65.16]	-0.03 (N=38616) [-85.26]	-0.04 (N=20426) [-67.34]	-0.008 [-10.56]	0.009 [12.35]	0.001 [1.47]

2009	0.05 (N=55161) [158.19]	0.06 (N=9628) [79.96]	0.05 (N=34828) [130.39]	0.03 (N=10705) [51.29]	0.01 [12.22]	0.01 [21.72]	0.03 [26.84]
Panel B: GARFINKEL-DIVOP (x 100)							
All years (2000-2009)	0.002 (N=602991) [4.48]	0.03 (N=124157) [29.90]	0.004 (N=339552) [9.27]	-0.03 (N=139282) [-39.77]	0.03 [23.66]	0.04 [38.96]	0.07 [47.71]
2001	0.08 (N=30220) [35.66]	0.15 (N=4073) [19.23]	0.08 (N=21284) [28.83]	0.04 (N=4863) [9.56]	0.07 [8.66]	0.03 [6.06]	0.10 [11.47]
2003	0.06 (N=66616) [102.15]	0.10 (N=15229) [62.50]	0.07 (N=36266) [83.93]	0.02 (N=15221) [20.01]	0.03 [15.80]	0.05 [30.93]	0.07 [37.29]
2005	0.03 (N=80070) [27.07]	0.09 (N=16294) [21.62]	0.03 (N=44666) [21.99]	-0.007 (N=19110) [-3.12]	0.06 [12.66]	0.04 [15.38]	0.10 [20.68]
2007	-0.10 (N=76584) [-84.76]	-0.11 (N=17799) [-63.64]	-0.09 (N=38406) [-50.47]	-0.12 (N=20377) [-44.66]	-0.02 [-9.30]	0.03 [10.20]	0.01 [3.08]
2009	0.12 (N=55161) [189.18]	0.15 (N=9628) [99.44]	0.12 (N=34828) [148.97]	0.08 (N=10705) [66.93]	0.03 [17.22]	0.04 [25.75]	0.07 [34.62]
Panel C: MARKET-ADJUSTED TURNOVER							
All years (2000-2009)	0.49 (N=602991) [68.01]	0.45 (N=124157) [31.12]	-0.06 (N=339552) [-9.04]	1.91 (N=139282) [92.69]	0.52 [32.00]	-1.97 [-90.78]	-1.48 [-57.73]
2001	0.10 (N=27719) [10.78]	1.02 (N=4527) [27.54]	-0.13 (N=19324) [-16.82]	0.31 (N=3868) [7.89]	0.34 [12.43]	-1.15 [-30.49]	-0.80 [-17.75]
2003	0.15 (N=67594) [25.97]	0.33 (N=15481) [53.34]	-0.18 (N=36751) [-31.79]	0.88 (N=15362) [16.07]	-0.001 [-1.05]	0.03 [33.11]	0.03 [25.85]
2005	0.001 (N=80070) [1.86	0.68 (N=16464) [45.96]	0.16 (N=44690) [21.56]	1.73 (N=19251) [87.26]	0.51 [30.95]	-1.56 [-73.63]	-1.04 [-42.26]
2007	-0.04 (N=76898) [-126.42]	-0.009 (N=18051) [-0.38]	-0.52 (N=38797) [-29.97]	1.80 (N=21099) [56.83]	0.51 [16.68]	-2.31 [-64.24]	-1.80 [-44.74]
2009	0.07 (N=55161) [8.02]	-0.005 (N=9628) [-0.29]	-0.41 (N=34828) [-47.04]	1.06 (N=10705) [57.13]	0.41 [21.41]	-1.81 [-69.77]	-1.40 [-46.95]
Panel D: BUYSELLRATIO							
All years (2000-2009)	0.007 (N=537558)	-0.02 (N=108680)	0.002 (N=303362)	0.04 (N=139282)	-0.02 [-89.28]	-0.04 [-183.11]	-0.06 [-224.89]

	[71.43]	[-95.85]	[13.91]	[229.88]			
2001	-0.01 (N=24064) [-30.84]	-0.05 (N=3235) [-31.05]	-0.02 (N=17038) [-34.22]	0.03 (N=3791) [22.11]	-0.03 [-14.35]	-0.06 [-34.99]	-0.09 [-37.86]
2003	0.005 (N=39578) [10.93]	-0.03 (N=9233) [-35.05]	-0.001 (N=20633) [-1.60]	0.05 (N=9712) [64.69]	-0.03 [-27.61]	-0.05 [-51.93]	-0.09 [-69.48]
2005	0.01 (N=68080) [39.38]	-0.03 (N=13416) [-43.93]	0.007 (N=38414) [18.53]	0.05 (N=16254) [102.26]	-0.03 [-47.16]	-0.05 [-72.89]	-0.08 [-100.13]
2007	0.01 (N=59577) [54.32]	-0.006 (N=13768) [-12.03]	0.007 (N=30083) [27.23]	0.04 (N=15726) [88.14]	-0.01 [-24.04]	-0.03 [-56.85]	-0.04 [-65.52]
2009	0.006 (N=55161) [35.56]	-0.01 (N=9628) [-31.26]	0.006 (N=34828) [29.44]	0.02 (N=10705) [59.02]	-0.02 [-40.95]	-0.02 [-40.05]	-0.04 [-63.69]

Appendix Table AI: Explanations on derivation of variables

Variables	Abbreviation	Definition/description
Handa et al. (2005)'s divergence of opinion component of bid-ask spread	HANDA-DIVOP	We first construct a proxy for order imbalance k (for every 5-minute interval per day) based on a high-frequency dataset provided by CSMAR which contains time-stamped record for every trade executed (at which point the best 5 bid and ask quotes are recorded—before September 2003 only the best 3 bid and ask quotes are available). We verify that the relative spread follows an inverted U-shape (lower for the extreme quintiles and higher for the middle quintile of order imbalance), consistent with Handa et al. We then estimate the model parameters H, p, (Vh-Vl) and r simultaneously for each stock each day using the generalized method of moments (four lagged values of the imbalance parameter k are used in the estimation).
Garfinkel's (2009) direct measure of divergence of opinion	GARFINKEL-DIVOP	The daily standard deviation (across all orders) of the distance between each order's requested price and the most recent trade price preceding that order. Outliers are ignored in the calculation. Based on all orders in CSMAR and computed according to Equations 1 and 2 in Garfinkel (2009).
Garfinkel's (2009) standardized unexplained volume	SUV	Standardized prediction error from a regression of daily turnover on the absolute value of returns for the firm. Computed according to Equations 4-6 Garfinkel (2009) using daily stock turnover and returns.
Amount of private information trading	PRIVATE	Annual amount of private information trading of Llorente et al. (2002) given for each firm-year by the $C2_i$ estimate of the time-series regression: $R_{it+1} = C0_i + C1_i * R_{it} + C2_i * V_{it} * R_{it} + ERROR_{it+1}$, where R_{it} is daily stock return and V_{it} is log daily turnover detrended by subtracting a 200-trading-day-moving- average.