The Quantity and Quality of Media Coverage and Its Impact on Stock Price Informativeness and Trading Activity: Evidence from China

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Abstract

Despite the increasing recognition that the press could play a corporate governance role and act as a public monitoring mechanism, there is limited evidence regarding whether, and how the press contributes to financial information flows and decision-making. The existing evidence, mostly based in the United States, presents a conflicting view on the role of the media in affecting financial market outcomes. This paper examines the role of the financial news media in the emerging stock market of China during the period 2000-2006. We focus on the impact of news coverage on the extent to which share prices incorporate firm-specific relative to market-wide information (i.e. stock price informativeness), and the impact of news coverage on stock turnover. We compile a comprehensive measure of news coverage using content analysis, which takes into account both the quantity and quality of news reports. The empirical validity and explanatory power of this measure of news coverage is compared with that of an alternative measure based on a simple frequency count of news reports. A consistent

result that emerges from this study is that more media coverage is associated with higher stock price informativeness and higher levels of stock turnover. This relationship holds irrespective of how media coverage is measured. For the first time in the literature, we design tests that aim to assess the relative importance of the quantity of news coverage and the quality of news coverage. The bulk of the empirical evidence suggests that relative to the quality of news coverage, the quantity of news coverage has a greater impact on stock price informativeness and stock turnover. Nevertheless, the quality of news coverage does matter.

Key words: Media coverage, information environment, public monitoring, corporate governance, stock price informativeness, trading activity

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1. Introduction

This paper examines the role of the financial news media in corporate finance and corporate governance in China. Despite the increasing recognition that the press could act as a monitoring mechanism, there is limited evidence regarding whether, and how the press contributes to financial information flows and decision-making, especially in accounting and finance. The existing academic literature provides a rather disparate and conflicting view of the roles of the news media. One school of thought questions the validity of the press as an important information intermediary and even suggests it may play a negative role, i.e., by catering to the lowest denominator and focusing on sensationalizing issues in order to sell papers (Jensen, 1979; Core, Guay and Larcker, 2008). Others allege that the news media, along with company officials and securities analysts, have misled or misinformed investors to support their own personal agendas (Moss, 2004). Another school of thought, following Dyck and Zingales (2002), Stiglitz (1999, 2002) and others, holds that the press plays a positive role in corporate finance and corporate governance, politics and economic development, by promoting corporate transparency through information dissemination, and by placing public pressure on managers, politicians, and regulators. To date, there is very limited empirical evidence, most of which comes from the Western world (mainly the United States), supporting any one of these theories.

The Chinese stock market is characterized by relatively unseasoned retail investors who account for the lion's share of stock turnover. With its wide circulation at minimal cost, financial newspapers have the potential to increase information dissemination and reduce the information asymmetry existing between managers and investors, as well as the information asymmetry existing among investors. Thus, financial newspapers in China are expected to impact managers and regulators, and draw investors' attention to new facts or facts that may have been well known. By increasing the coverage of a company, the news media can set in motion a sequence of public attention and become a fundamental determining factor in stock price movements.

This paper empirically investigates how media coverage affects stock price informativeness and trading activity in China, for the first time in the literature. Given the lack of a well-established model and measure of news coverage, we propose a comprehensive empirical measure of news coverage using content analysis, a well

established technique in the social science, that takes into account both the quality and quantity of news reports. The empirical validity and explanatory power of this measure of news coverage is contrasted with that of the often-used alternative, i.e. the number of times a company is mentioned in the press, irrespective of the content of such news reports.

A consistent result that emerges from this paper is that more media coverage is associated with higher stock price informativeness and higher levels of stock turnover. This relationship holds irrespectively of whether news coverage is measured by a simple frequency count of news reports, or by the more comprehensive content-analysis based alternative. In terms of the relative importance of the quantity and quality of news coverage in affecting share performance, we find that in the majority of cases the quantity of news coverage has a stronger and more consistent impact on stock price informativeness and stock turnover, but in many cases the quality of news coverage is found to also have an impact. Overall, our empirical results are consistent with investors being influenced by media coverage and engaging in attention-based trading. This suggests that for companies it may pay to increase their visibility (or perceived transparency) through higher media exposure. For regulators, especially those from emerging markets with under-developed financial institutions, the evidence that media coverage positively affects stock price informativeness and investors' trading behavior suggests they should consider liberalizing the financial news media so as to enable the media to perform an alternative corporate governance role.

Our paper makes two main contributions to the literature. First, we shed light on the relationship between news coverage and the extent to which stock prices incorporate firm-specific relative to market-wide information, and the relationship between news coverage and trading activity. Second, we empirically test the relative validity of two alternative measures of news coverage, for the first time in the literature. By validating these measures of news coverage, our paper adds to the rapidly growing body of research on the corporate governance role of the media, and research on the effects of media coverage on financial market outcomes.

The remainder of this paper is structured as follows. Section 2 reviews the literature on the role of the media in corporate finance and corporate governance, and provides some background information about the financial news media in China. Section 3 develops the research hypotheses. Section 4 discusses the sample data and variable measurement, Section 5 presents the empirical results, while Section 6 provides a summary and concludes.

2. Background

2.1. Media coverage as a source of information

Despite the increasing recognition of the role of the press as a control variable in accounting and economic studies, there is limited evidence regarding whether, and how the press contributes to financial information flows (Miller, 2006). The academic literature provides a rather disparate, and often conflicting, view of the roles and effects of the news media. One school of thought questions the validity of the press as an important information intermediary in the economy (Jensen, 1979; DeAngelo, DeAngelo and Gilson, 1994, 1996). As evidence in support of the argument that the press plays an insignificant role in, and thus has insignificant effects on, financial markets, critics cite research which finds that substantial movements in share prices do not seem to correspond to changes in economic fundamentals. For example, Cutler, Poterba and Summers (1989)—building on Niederhoffer (1971)—consider macroeconomic news in the United States and show that it is difficult to explain more than one third of the return variance of the market index from this source. When they focus on market moves coincident with major political and world events, they find that large market moves often occur on days without any identifiable major news releases. Their results, however, do not illuminate the possibility of differential effects of news coverage on the stock price of different industries or firms, nor do they rule out the possibility that news coverage may affect firms or the broader market in ways other than *immediate* price changes. After examining the role of the news media in causing the stock market crashes of 1929 and 1987, Shiller (2005) concludes that the news stories that broke around the time of the crashes were not the essential cause of the crashes. Nevertheless, Shiller (2005) suggests that news events have the effect of causing an attention cascade among investors by heightening their fixations on market moves, and in so doing, the news media become fundamental propagators of speculative price movements.

The impact of media reports on stock prices is formalized in Merton (1987), who posits an asset pricing theory that deviates from the capital asset pricing model because investors invest in the shares of companies they are familiar with. He 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 and increase the market value of the firm, a hypothesis that is empirically supported in Amihud, Mendelson and Uno (1999). Merton (1987) notes that a newspaper or other mass media story about the firm or its industry that reaches a large number of investors who are not currently shareholders could increase the number of investors in the

firm. 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. The disclosure of more (even if "public") information has come to be regarded as a useful way of enhancing liquidity and lowering the cost of capital (see Coller and Yohn, 1997; Amihud and Mendelson, 2000; Botosan, 1997, 2000).

Research on the impact of media coverage is closely related to the rapidly growing body of research on investors' tendency to invest with a company they know (or think they know). Kang and Stulz (1997), Huberman (2001) and Li (2004) among others provide compelling evidence that people invest in the familiar while often ignoring the principles of portfolio theory. One psychological factor driving such a familiarity bias is the fact that familiarity is associated with a general sense of comfort with the known (certainty). Huberman (2001) notes that (perceived) familiarity may be higher if the firms are visible in the investors' lives, or when the stock is discussed favourably in the media. Barber and Odean (2003) argue that because individuals face great difficulty in searching the stocks they can potentially buy, they tend to engage in attention-based buying. To the extent that the media as a channel for mass communication grab investors' attention and provide topics for conversation-making and word-of-mouth information-sharing (Shiller and Pound, 1989; Shiller, 2005), and to the extent that social interaction among investors makes it more likely for them to invest in the stock market (Hong, Kubik and Stein, 2004), it is expected that the news media will have an important role to play in affecting financial market outcomes. There is, however, only limited empirical evidence in this regard either within or outside the United States.

2.2. Media coverage as a public monitoring mechanism

It is generally acknowledged that media coverage has the effect of reducing information asymmetries, increasing transparency, and providing useful information to various stakeholders. The *Wall Street Journal*, for example, was instrumental in bringing to light the problems of Enron, which led to regulatory investigations and subsequently the collapse of Enron (Salter, 2008). By disseminating information to a broad-based investor community on a daily basis, the financial news media may complement corporate disclosures, analyst following, and regulatory monitoring. Bushman, Piotroski and Smith (2004) identify media penetration as a key determinant of corporate transparency. Dyck and Zingales (2002) argue that press coverage is important due to the

pressure it places on management and regulators. Dyck, Volchkova and Zingales (2008) study shareholders' ability to influence media coverage and the impact of such coverage on corporate governance by focusing on a low-turnover investment fund in Russia which consciously played a media strategy over the period 1999-2002. They find that the presence of the fund among the companies' shareholders increases the amount of coverage a corporate governance violation receives. In addition, they find that a bad corporate governance decision is reverted following an increase in coverage of the event in Anglo-American newspapers (but not in the local press), and that the probability of this reversal is significantly affected by media coverage. Dyck, Volchkova and Zingales (2008) conclude that media coverage in Russia has an effect by increasing the reputational cost of managerial misbehavior vis-à-vis the international business community.

Core, Guay and Larcker (2008) examine the role of the press in monitoring and influencing executive compensation practices in the United States from 1994-2002. They use an iterative key word search procedure to partition press articles about CEO compensation based on whether they have a negative tone. Consistent with the idea that the press engages in sensationalism, they find that the press focuses negative attention on CEOs with large option exercises. They find no consistent evidence that total compensation decreases after CEOs receive negative press coverage, and no evidence that negative press coverage of CEO compensation is related to CEO turnover. They conclude that their results do not corroborate recent research that the media exerts an important influence on corporate governance choices. Among the limitations cited, Core, Guay and Larcker (2008) note that there is measurement error in their measurement of (negative) press coverage, as there is not a well-established model for press coverage. The different ways in which media coverage is measured may be behind the conflicting results in some past studies. It is thus useful to more closely examine the possible measures of media coverage available and compare their empirical validity. Our paper makes a first attempt at this.

2.3. The financial news media in China

Most, if not all, of the theories of and empirical evidence on the role of the media are based on the free market economies, mainly the United States. Traditionally, the Chinese government has retained strong political control over the news media. However, many issue areas have gradually opened up for relatively free reporting, especially in arts and leisure, and finance and economics (Esarey, 2006). Recent years have witnessed

increased attention being paid to the role of the financial news media in China, in a bid to put to good use the media as a public monitoring device, a role that is explicitly recognized in a recent report issued by the State Council (State Council Development Research Centre Report No. 11 on Financial Reform and Financial Safety). There is no shortage of instances of the positive role played by the Chinese news media in whistle-blowing on corporate misdeeds (see Liu, 2006; Pan, 2006).

However, the potential impact of the news media in China is adversely affected by a number of factors. First, there is no existing legislation that empowers the press with the right to investigate into the truthfulness of any information disclosed by listed companies. This often results in reporters being denied access to corporate information, and has given rise to a growing number of lawsuits in which the news media and the reporters involved are faced with charges of libel. In almost all cases, the media and the reporters lost and had to pay large sums of damages. The threat of lawsuits has the potential to deter, and is believed to have deterred, many truth-finding attempts by the media (Esarey, 2006; Pan, 2006). Second, the China Securities Regulatory Commission (CSRC) requires that all mandatory information disclosures be published in at least one of seven designated publications. Such requirement, it is feared, may result in a lack of competition and hence "media capture" whereby the designated media become overly reliant on the fee-paying listed companies and thus may refrain from publishing criticisms of such companies. Some reporters even submit their draft reports to the companies involved for approval before they are released (Wang, 2005; Liu, 2006). Such practices, as well as undue influences by government agencies (e.g. when the government owns/controls both the press and the listed company being scrutinized), are believed to result in a lack of media independence and credibility, which determine the potential impact of media coverage. A third factor that may further weaken the potential of the news media to play an active role in China is the lack of professionalism in China's financial news industry, which is criticized as lagging behind major corporate developments and thriving on rumors (Pan, 2006).

Given the unsettled theoretical debate on the role of the mass media in the financial market, and in view of the complicated interplay among the various factors that either promote or inhibit the public monitoring role of the financial news media in China, it remains an empirical question whether, and to what extent, media coverage affects overall share performance. To our knowledge, this is the first paper to provide systematic evidence on the effects of media coverage in the Chinese stock market.

3. Research hypotheses

The above review of the literature suggests that, by reducing (perceived or actual) information asymmetries associated with a firm and by making the firm more transparent, the news media have the potential to affect various aspects of corporate finance and corporate governance. This paper focuses on examining two key aspects: stock price informativeness, and trading activity.

We hypothesize that stock price informativeness, or the extent to which stock prices incorporate firm-specific information relative to market-wide information, is enhanced by media coverage. Prior research (e.g. Morck, Yeung and Yu, 2000; Chan and Hameed, 2006; Jin and Myers, 2006) suggests that if the firm's information or institutional environment causes stock prices to incorporate more firm-specific information, market factors should explain a smaller proportion of the variation in stock returns, i.e. the return synchronicity or R-squared from a market model regression should be lower. Several reasons may be cited for our hypothesis. First, media coverage makes information available to a large number of people at minimal cost, thus lowering the cost of information collection. To the extent that such information is useful and accepting that certain investors may be better at interpreting public information, it increases the chance of informed investors profiting from such information (or at least avoiding losses). According to Grossman and Stiglitz (1980), improving the cost-benefit tradeoff on information collection leads to more informed trading and more informative pricing. Second, by diffusing information that they collect, select, certify and repackage, the media help to reduce information asymmetries and promote transparency, which is strongly related to stock price informativeness (Jin and Myers, 2006). Third, media coverage increases the reputation cost of regulators, intermediaries and managers, and thus has the potential to improve corporate governance (Dyck, Volchkova and Zingales, 2008). Better corporate governance, in turn, leads to more informative stock prices by encouraging collection of and trading on private information (Ferreira and Laux, 2007). The effect of media coverage on stock price informativeness is further strengthened as the aforesaid factors tend to reinforce one another.

We hypothesize that trading activity (volume and turnover) is positively affected by media coverage, even after controlling for other relevant economic variables. The theoretical models of Kyle (1985) and Glosten and Milgrom (1985) predict that trading costs increase with the degree of information asymmetry between the market maker and informed investors, or the ratio of informed to uninformed traders. Media coverage is expected to positively affect trading volume and turnover (a form of liquidity) for the

following reasons. First, as explained above, media coverage increases information dissemination and reduces information asymmetry. Reduced information asymmetry between managers and investors reduces estimation risk, while reduced information asymmetry among investors increases market liquidity for securities (Botosan, 2000). Given that listed companies in China are typically owned or controlled by government entities (holders of non-tradable state and legal person shares) with access to insider information and superior resources, vis-à-vis inexperienced and speculative individual investors who account for the lion's share of stock turnover, information asymmetries and stock price manipulation are considered to be particularly severe in China (Chen and Xiong, 2001; Tian and Guo, 2007; Eun and Huang, 2007). The problem is likely to be mitigated by media coverage, with the result that all else being equal, liquidity should be higher for companies that are more visible. Ng and Wu (2006) provide evidence to suggest that both wealthier and less wealthy individual investors in China prefer high liquidity stocks. Second, companies receiving greater media coverage tend to be larger companies which attract higher analyst following and tend to be better known and less risky, such that they are usually more actively traded. It will be interesting to see whether media coverage simply proxies for these factors or if it has incremental power beyond these factors.

4. Sample selection and variable measurement

We test for the impact of news coverage on share performance by devising empirical measures of news coverage for all China-listed A-shares during the period 2000-2006. 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 other forms of misdeeds (Pan, 2006). Second, the first report by the financial news media on major corporate misdeeds occurred in October 2000 when the Chinese language *Cai Jing* (Fortune) magazine published an article titled "Insider Story of Funds". This marked the beginning of waves after waves of whistle-blowing by the financial news media on corporate misdeeds in China and led to the earmarking of the year 2001 by CSRC as a year for stepping up regulatory monitoring (Pan, 2006). Thus the year 2000 may be taken to be the year when the general public investors and regulators first became attracted to the financial news media. Third, the year 2000 is the first year in which the database WiseNews maintains searchable archives of *China Securities*, one of the oldest and most authoritative national newspapers focusing on the securities market,

which we use for composing empirical measures of news coverage[1]. *China Securities* is one of the seven CSRC designated publications where mandatory disclosures must be published.

4.1. Measurement of news coverage

The strength of the impact of media coverage is related to several factors. One factor is the independence, credibility and reach of the news media (Islam, 2002). Another is the content of the media report (e.g. what kind of information is provided; how the company, industry or economy is portrayed). Past research indicates that the content of the news reports affects stock prices in different ways. Using the General Inquirer to construct a measure of media pessimism from a popular column in the Wall Street Journal, Tetlock (2007) finds that high levels of media pessimism robustly predicts downward pressure on market (i.e. the S&P 500 index) prices, followed by a reversal to fundamentals. Tetlock, Saar-Tsechansky and Macskassy (2008) examine the impact of negative words in all Wall Street Journal and Dow Jones News Service stories about individual S&P 500 firms from 1980 to 2004. They find that negative words convey negative information about firm earnings above and beyond stock analysts' forecasts and historical accounting data, and that stock prices respond to the information embedded in negative words with a small, one-day delay. More interestingly, they find that negative words in stories about firms' fundamentals predict earnings and returns more effectively than negative words in other stories. Since Tetlock (2007) and Tetlock, Saar-Tsechansky and Macskassy (2008) focus on the association of negative media coverage with stock price and earnings, it remains to be seen whether, and how, overall media coverage (irrespective of the linguistic tone) is related to share performance.

A well-established measure of overall news coverage is currently missing. Some past studies use the number of times a company is mentioned in the news as a measure of news coverage (e.g. Chan, 2003; Fang and Peress, 2007; Duarte et al., 2008). However, there is reason to believe that such a measure (sometimes called "news worthiness") may be noisy and may not effectively capture the construct it is meant to measure. This is

[1] Although *China Securities* is one of China's oldest and most authoritative national newspapers focusing on the securities market, it is possible that some listed companies are covered more extensively in other financial newspapers than in *China Securities*. To explore such a possibility, for a random sample of 50 companies we collected the news articles on the same randomly selected days (one for each month) from *China Securities* and from *Zheng quan shi bao* (*Securities Daily*), another major securities newspaper. We compared the content-analysis-based news coverage measure derived for each company in each of these newspapers following the procedure described in the Appendix. The average correlation coefficient is high at 0.89, indicating a high level of agreement in news coverage in both newspapers. This suggests that the results reported here are not due to our choice of *China Securities*.

particularly the case in China, where listed companies are required to publish their mandatory disclosures in at least one of seven CSRC designated publications. There are also allegations that some companies engage analysts or newspaper reporters to promote themselves or spread rumors. The publication of mandatory disclosures and propaganda-type reports that contain little information about company fundamentals do not constitute "news" in the real sense. A reading of the newspaper articles in *China Securities* indicates that many companies often are simply mentioned in passing, or appear in a long list of companies for which corporate announcements such as the ex-dividend date, date of Shareholders Meeting, or something else insignificant as news are reproduced. Thus a simple frequency count of news reports for a company may introduce noise and reduce the effectiveness of the resultant measure to capture the theoretical construct, and is inconsistent with the aforementioned body of evidence which suggests that the content of written texts affect stock prices (and in different ways).

Given the increasing recognition of the role of the press as a control variable in accounting and economic studies, it is necessary to explore the validity of different measures of news coverage. We propose a comprehensive measure of news coverage by content analyzing news articles in *China Securities* in which a company's name (full name and/or abbreviations) or stock code is mentioned. As a well-established methodology in communication research and social science, content analysis refers to a research technique for making systematic, replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use (Krippendorff, 2004), and extends far beyond plain word counts or simple frequency counts. We implement the content analysis methodology following Neuendorf (2002), Krippendorff (2004) and Riffe, Lacy and Fico (2005). Details of the content analysis methodology appear in the Appendix.

4.2. Measurement of price informativeness and trading activity

We follow the existing literature to define and measure the other key variables. For firm-level stock price informativeness, we follow Ferreira and Laux (2007) and use the logistic transformation of 1-R^2 (they call this "idiosyncratic volatility", IV) from the market model as the baseline measure. This is represented as:

$$IV = \ln(\frac{1-R^2}{R^2}), \qquad \text{(Equation 1)}$$

where R^2 is from the market model $R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$. This is estimated using Ordinary Least Squares and daily returns over every calendar year (a minimum of 100 trading days per year with usable returns is required for inclusion). To account for the

possibility that firms in some industries may be more subject to influences of market-wide movements than others, we include industry dummies in the subsequent regression equations. The Fama and French (1992) three-factor model is not used due to data availability problem in the Chinese stock market context. Variations of the baseline measure of stock price informativeness are also used for robustness checks.

We measure trading activity in three ways. The first is stock turnover (TURNOVER), defined as ratio of the number of share traded to the number of tradable shares per month. We also use the natural log of the number of shares traded (TS) and the natural log of the value of shares traded (TT) per month as alternative measures of trading activity. In all cases the monthly values in a given year are averaged to obtain the annual measure of trading activity.

A number of variables identified in the literature as influencing stock price informativeness and trading activity are used as control variables. Following Ferreira and Laux (2007) and Wei and Zhang (2006), we include the following control variables in the stock price informativeness and trading activity tests: profitability (ROE), profits volatility (VROE), financial leverage (LEVERAGE), market-to-book ratio (MTB), log of market capitalization of equity (SIZE), a dividend payer dummy (DD), and firm age since listing (AGE). In addition, we add systematic risk (BETA) as an additional control variable in the stock price informativeness tests following Dasgupta, Gan and Gao (2008), who argue that it is necessary to control for the beta effect in firm-level studies of R^2 when one is primarily interested in how the information environment affects idiosyncratic volatility. In our empirical tests predetermined values of beta (lagged by one year) are used to take into account the functional relationship between beta and R^2. A number of other control variables that are identified in the literature or that are expected to impact trading activity are included in the trading activity tests, including the ratio of tradable shares to total shares. Year dummies, industry dummies and a stock exchange dummy are included in all tests.

We explicitly test the relative validity of our comprehensive news coverage measure as compared to a simple frequency count of news reports by inserting these into the models one by one, and by compiling composite measures of the two. A positive coefficient for the news coverage measure is interpreted as evidence in support of the hypothesis that media coverage affects the chosen aspect of share performance.

The key data (including stock price, returns, financial data and stock trading data) required for this study are from the China Stock Market and Accounting Research (CSMAR) database.

5. Empirical results

5.1. Descriptive statistics

Table 1 presents the summary statistics for the key variables used in the empirical tests. The sample firms have an average of close to 6 years since listing (AGE), an average firm size (SIZE, or log of market capitalization of equity) equal to 14.49, and an average beta (BETA) of 1.06. The average market-to-book ratio (MTB) of 1.13 indicates that the shares generally do not sell at values substantially above book value. With an average value of -0.001 and a median of 0.06, the return-to-equity (ROE) is generally low and appears unevenly distributed. These statistics are similar to those reported in most other studies and indicate that the sample firms are representative of the overall population. The average ratio of tradable shares to total shares outstanding (TRADABLE_R) is 0.39, indicating that on average, less than 40% of the shares are tradable. This justifies our measurement of turnover as the number of shares traded divided by the number of tradable shares, as opposed to the total number of shares outstanding, many of which are non-tradable. The average stock turnover (TURNOVER) is 5.26. The average R-squared (RSQ) from the market model is 0.41. This corresponds to an average logistic transformation of R-squared (IV) equal to 0.45.

The content-analysis-based measure of news coverage (EXPOSURE) has a mean of 1.8, and a standard deviation of 3.19. The values range from a minimum of 0 to a maximum of 30.51. This indicates a lack of sufficient dispersion. In fact, over 50% of the firm-observations have no values for EXPOSURE during the period under examination. This dearth of media exposure in large part is the result of our stratified random sampling procedure, whereby we examine the news reports on only one randomly chosen day per month in a given year in order to make the task manageable. In contrast, the rough hits measure of news coverage (HITS, or number of news reports for a company in a given year) ranges from a minimum of 0 to a maximum of 472, with the mean being about 42. The bottom 25% of the firm-observations has fewer than 16 hits, and the top 25% has more than 57 hits. Because of the different ways in which these two variables are measured, they may capture different aspects of news coverage. For example, a company may rank high in terms of the number of news reports it gets (high value for HITS), but it may rank low in terms of the content-analysis-based measure of news coverage (i.e. low value for EXPOSURE) if it is only mentioned in passing in the news reports without discussions of company fundamentals. Thus it may be convenient (and perhaps adequate) to refer to HITS as capturing mainly the “quantity” of news coverage, and EXPOSURE

as capturing mainly the "quality" of news coverage (despite the fact that it also reflects elements of "quantity"). In subsequent analyses we further categorize the sample firm-observations into those that rank high in both measures, those that rank low in both measures, and those that rank high on one measure and low in the other. These categorizations help to assess the relative importance of these two alternative measures of news coverage in affecting stock price informativeness and trading activity.

Table 2 reports the distribution of the two news coverage measures over time and across the two Chinese stock exchanges. From Panel A, it is noted that for the entire sample, there is an upward trend in the content-analysis-based measure of news coverage (EXPOSURE), although the upward trend is not very strong. An upward trend is also noted for the alternative measure of news coverage based on a simple frequency count of news reports (HITS). Thus, there seems to be an increase in overall news coverage for the sample firms during the period under examination. From Panel B and Panel C, it is noted that the distribution of the news coverage measures does not vary systematically across the two stock exchanges.

Table 3 presents the Pearson correlation coefficients between the key variables used in the empirical tests. First focusing on our two dependent variables, we note that our measure of stock price informativeness (IV) is positively related to both EXPOSURE and HITS, and is strongly related to average daily return (DRET) and the variance of daily return (VAR_DRET). The same is true for stock turnover (TURNOVER). The key independent variables EXPOSURE and HITS are positively but less than perfectly correlated, with a correlation coefficient equal to 0.41. Given the way these measures are constructed, the positive correlation is to be expected and corroborates the impression that can be gleaned from Table 2. EXPOSURE is also strongly related to average daily return. Apart from a similar strong correlation with average daily return, HITS is also positively and strongly correlated with the ratio of tradable shares to total shares (TRADABLE_R) and daily return variance. Several other independent variables are strongly correlated, most notably between leverage (LEVERAGE) and ROE, and between average daily return and variance of daily return. Tests for the presence of multicollinearity using variance inflation factors (VIF) and related diagnostics reveal that few of these explanatory variables have a VIF over the cutoff value of 10 so multicollinearity does not appear to be a serious problem.

5.2. Effects of media coverage on price informativeness

Our first set of tests focuses on the relationship between stock price informativeness

and a number of firm-specific variables. Our key interest lies with the two measures of news coverage, EXPOSURE and HITS, for which a positive coefficient is expected. Since a well-established theory of determinants of stock price informativeness is lacking, several versions of the basic model are tested. We include essentially the same control variables as used in Ferreira and Laux (2007) for comparability, with the exception of the diversification dummy for which data is not available in the China stock market context. Given our focus, we use measures of new coverage as the key independent variable, in place of measures of corporate governance used in Ferreira and Laux (2007). Table 4 presents the empirical results.

Model 1 contains only EXPOSURE as the explanatory variable. Although it has a statistically significant positive coefficient, EXPOSURE explains only 1% of the variation in stock price informativeness[2]. In Model 2 we add the control variables used in Ferreira and Laux (2007), plus three dummy variables: a stock exchange dummy (EXCHANGE_DUM), a year dummy (YEAR_DUM), and an industry dummy (INDUSTRY_DUM). It is noted that EXPOSURE retains a statistically significant positive coefficient, suggesting that news coverage increases the extent to which firm-specific information is incorporated into share prices, and this relationship holds even after controlling for variables that are known to affect stock price informativeness. The R-squared of 34.36% indicates that the model has good explanatory power.

Model 3 is the result of adding BETA to Model 2. This additional variable substantially increases the explanatory power of the model raising the R-squared to 43.26%, but the coefficient of EXPOSURE remains positive and statistically significant. The strong relationship between BETA and stock price informativeness suggests that this variable should be included in firm-level studies of stock price informativeness, consistent with the argument in Dasgupta, Gan and Gao (2008).

One of the key objectives of this paper is to compare the empirical validity of different measures of news coverage. Models 4 through 6 are the result of replacing EXPOSURE by HITS in models 1 through 3. The variable HITS alone explains 1.6% of the variation in stock price informativeness (Model 4). Adding the control variables used in Ferreira and Laux (2007) and the three dummy variables discussed above (Model 5) substantially increases the goodness-of-fit to 35.72%. When BETA is further added (Model 6), the R-squared further increases to 44.54%. In all cases, HITS has a statistically

[2] The magnitudes of the R-squared reported here when our news coverage measures are the sole explanatory variable are comparable to those in Ferreira and Laux (2007) when various measures of governance are used as the sole explanatory variable.

significant positive coefficient. This suggests that the more often a firm appears in the news (irrespective of its linguistic tone or content), the greater is its stock price informativeness. The results so far suggest that, all else equal, more media coverage (as measured by either EXPOSURE or HITS) causes the stock price to reflect more firm-specific relative to market-wide information.

It is of interest to more closely examine the validity of our two measures of news coverage. Given the way it is constructed, EXPOSURE not only measures the number of times a company appears in the news, but more importantly, it takes into consideration the quality of the news reports, i.e. the extent to which the news reports relate to company fundamentals (see the Appendix for details). In contrast, HITS takes the number of times a company is covered in the news at "face value", i.e. it does not distinguish between companies being mentioned only once in passing without reference to their business fundamentals, and companies being the subject of a dedicated news report that contains detailed discussions on their business fundamentals. If the financial news media are a source of value-relevant information, one would expect these different measures of news coverage to have different implications for the extent to which firm-specific information (relative to market-wide information) is incorporated into share prices. Specifically, all else being equal, one would expect companies which are the subject of dedicated news reports about their business fundamentals (i.e. high value for EXPOSURE) to be more highly associated with stock price informativeness than companies that are only mentioned in passing (i.e. low value for EXPOSURE), even when they have the same value for HITS. On the other hand, if investors are swayed by the greater "visibility" of companies that appear more often in the news despite the fact that the news reports contain little reference to business fundamentals, one would expect a positive relationship between HITS and stock price informativeness that is not moderated by differences in the quality of the news coverage (EXPOSURE). As a first attempt to discriminate between these competing hypotheses, we create two dummy variables, HIGHQQ and LOWQQ. The variable HIGHQQ (LOWQQ) takes the value of 1 if the values for both EXPOSURE and HITS are in the top (bottom) 25%, and a value of 0 if the values for both EXPOSURE and HITS are below (above) the median[3]. Intermediate observations are discarded. Thus, firm-observations classified as HIGHQQ (LOWQQ) are essentially firm-observations that have high (low) scores in both the quality and quantity of news coverage. By design, the coefficient on HIGHQQ (LOWQQ) reflects the differential

[3] The results are qualitatively similar if HIGHQQ is coded 0 when both EXPOSURE and HITS are in the lower 75%, and if LOWQQ is coded 0 when both EXPOSURE and HITS are in the upper 75%.

effects on stock price informativeness of firms with observed values of quantity and quality of news coverage in the top (bottom) 25%, relative to firms with corresponding values of news coverage below (above) the median. We rerun the regression equations and the results are reported in Table 5.

Model 1 in Table 5 shows the results after including LOWQQ as an additional explanatory variable. The coefficient of EXPOSURE falls in magnitude but still retains statistical significance, while the coefficient of LOWQQ is negative and highly statistically significant. This suggests that firm-observations characterized by news coverage that is low in both quantity and quality are associated with lower stock price informativeness relative to those in the other category. Further, even among the LOWQQ firms, higher quality news coverage (i.e. higher values for EXPOSURE, reflecting more discussions of company fundamentals) still causes share prices to reflect more firm-specific information relative to market-wide information.

In Model 2 we replace LOWQQ with HIGHQQ while all the other control variables remain the same as in Model 1. The coefficient of HIGHQQ is positive and highly statistically significant, suggesting that firm-observations characterized by news coverage that is high in both quantity and quality are associated with higher stock price informativeness. The coefficient of EXPOSURE loses statistical significance. This suggests that when firms receive news coverage that is already high in both quality and quantity, those with relatively higher quality news coverage (i.e. higher values for EXPOSURE) does not possess much incremental power.

Model 3 is the equivalent of model 1 with HITS replacing EXPOSURE. The coefficient of HITS is positive and highly statistically significant, while the coefficient of LOWQQ is negative and highly statistically significant. These results suggest that firms characterized by news coverage that is low in both quantity and quality are associated with lower stock price informativeness, but even among such firms, those that have a larger quantity of news coverage (i.e. those with higher values of HITS) are associated with higher stock price informativeness.

Model 4 is the equivalent of model 2 with HITS replacing EXPOSURE. The coefficients of both HITS and HIGHQQ are positive and highly statistically significant. Thus, firms characterized by news coverage that is high in both quantity and quality are associated with higher stock price informativeness. Among these firms, those that have a larger quantity of news coverage are associated with higher stock price informativeness. Taken together, the results in Model 3 and Model 4 suggest that the number of times a company appears in the news possesses strong incremental power over and above what is

conveyed in a given threshold value of quantity and quality of news coverage.

The above tests, however, are not strong tests for the purpose of discriminating between the relative explanatory power of the quality of news coverage (EXPOSURE) and the quantity of news coverage (HITS). This is because these two variables are positively correlated. Thus companies that score high on HITS are likely to also score high on EXPOSURE and vice versa. To gain further insights into the relative power of these two empirical measures of news coverage, we next create two additional dummy variables by exploiting cases where EXPOSURE and HITS are negatively correlated. Specifically, we code HIGHQTY_LOWQLY as 1 if a firm-observation has a value for HITS that falls in the top 25% AND a value for EXPOSURE that falls in the bottom 25%. These are companies that appear in a large number of news articles but these news articles prove to contain little value-relevant information according to a content analysis. HIGHQTY_LOWQLY is coded 0 if a firm-observation has a value for HITS that falls in the lower 75% and a value for EXPOSURE that falls in the upper 50%[4]. These are companies that do not have as many news articles but those they do have contain above median value-relevant information. Next, we code HIGHQLY_LOWQTY as 1 if a firm-observation has a value for EXPOSURE that falls in the top 25% and a value for HITS that falls in the bottom 25%. These are companies for which there are relatively few news reports but these news reports are found in a content analysis to contain many discussions on their business fundamentals. HIGHQLY_LOWQTY is coded 0 if a firm-observation has a value for EXPOSURE that falls in the lower 25% and a value for HITS that falls in the upper 50%. These are cases with not-so-high values for EXPOSURE (quality) and not-so-low values for HITS (quantity)[5]. Given the positive correlation between the two measures of news coverage, it is not surprising that exploiting the cases where the two measures lie on opposite poles reduces the number of usable observations (substantially in some cases). The smaller number of observations tends to work against rejecting our null hypothesis but the power of the tests is probably increased by sharpening the contrast between the various categories. The results are presented in models 5 throughout 8 in Table 5.

Focusing on model 5 first, the coefficients of HIGHQTY_LOWQLY and EXPOSURE are both positive and statistically significant. Thus, relative to

[4] The results remain qualitatively similar if HIGHQTY_LOWQLY is coded 0 when a firm-observation has a value for HITS that falls in the lower 50% (i.e. they are not-so-high in quantity) and a value for EXPOSURE that falls in the upper 50%.

[5] The results remain qualitatively similar if HIGHQLY_LOWQTY is coded 0 when a firm-observation has a value for EXPOSURE that falls in the lower 50% (i.e. they are not-so-high in quality) and a value for HITS that falls in the upper 50%.

firm-observations with news coverage that is not so high in quantity and not so low in quality, firm-observations characterized by news coverage that is high in quantity but low in quality are associated with higher stock price informativeness, presumably due to the large quantity of news coverage they receive. But even among such firms, high quality news coverage increases stock price informativeness, as indicated by the positive coefficient of EXPOSURE. The impression that can be gleaned from the results in model 5 is that the quantity of news coverage has perhaps a greater impact on stock price informativeness, to the extent that it can make up for the low quality.

Model 6 provides further evidence on the importance of the quality, relative to the quantity, of news coverage. It is noted that the coefficients of HIGHQLY_LOWQTY and EXPOSURE are both negative but they are not statistically significant. Thus, relative to firm-observations with news coverage that is not so high in quality and not so low in quantity, those that have news coverage that is high in quality but low in quantity are not associated with higher stock price informativeness. And among such firms, the quality of news coverage does not make up for the small quantity of news coverage, as reflected in the negative (but statistically insignificant) coefficient of EXPOSURE. Taken together, these results suggest that having high quality news coverage cannot quite make up for the small quantity of such coverage. The results here therefore contrast with, and corroborate the impression gleaned from model 5 above.

Model 7 and model 8 are the equivalents of model 5 and model 6 with HITS replacing EXPOSURE. The coefficient of HIGHQTY_LOWQLY in model 7 is negative but it is not statistically significant. The coefficient of HITS is positive and statistically significant. In this specification, news coverage that is high in quantity but low in quality does not enhance stock price informativeness, but among firm-observations in this category, the quantity of news coverage does improve stock price informativeness. This contrasts with the results in model 8, where the coefficient of HIGHQLY_LOWQTY is negative but statistically insignificant and the coefficient of HITS is positive and statistically significant. The results in model 8 suggest that high quality news coverage does not quite make up for the low quantity, but among such firms characterized by news coverage that is high quality and low in quantity, a larger quantity of news coverage is associated with higher stock price informativeness.

As an intermediate summary, the results in this section suggest that news coverage is positively associated with stock price informativeness. This holds irrespectively of how news coverage is measured. Further supporting the empirical validity of these measures, news coverage that is high in both quantity and quality is found to significantly improve

stock price informativeness, while news coverage that is low in both quantity and quality is found to reduce stock price informativeness. In terms of the relative importance of the quantity and quality of news coverage, the majority of the evidence so far suggests that the quantity of news has a greater impact on stock price informativeness.

5.2. Effects of media coverage on trading activity

We hypothesize a positive relationship between media coverage and trading activity as higher news coverage increases the visibility and transparency of companies, and reduces information asymmetries and agency costs. In the absence of a well-established theory for the relationship between financial information flows and trading activity, we follow Ferreira and Laux (2007) and regress stock turnover against the same set of control variables used in the stock price informativeness tests above, plus the ratio of tradable shares to total shares. For a robustness check we replace the two profitability measures (ROE and VROE) with share return and return variance. The results appear in Table 6.

Model 1 and model 5 use EXPOSURE and HITS, respectively, as the only explanatory variable. In both cases the coefficient is positive and statistically significant. In model 2 and model 6 we add the control variables used in Ferreira and Laux (2007). The coefficients of EXPOSURE and HITS both remain positive and statistically significant. In model 3 and model 7 we further add the ratio of tradable shares to total shares and beta as additional control variables. While the coefficients of these newly added variables are statistically significant, the coefficients of EXPOSURE and HITS both remain positive and statistically significant. These results suggest that companies with greater news coverage are associated with higher stock turnover, even after controlling for other relevant factors. Replacing ROE and VROE with average daily return and return variance (model 4 and model 8) does not alter this conclusion. Thus, the results using stock turnover as the dependent variable corroborates the results using stock price informativeness as the dependent variable. It should also be noted that the coefficients for the control variables generally remain similar both in magnitude and statistical significance across the different models and that the explanatory powers of the models are good, with R-squared being over 50% in all cases except where the news coverage measures appear as the only explanatory variable.

To provide further evidence on the relative explanatory power of our two measures of news coverage, in Table 7 we insert dummy variables that represent composites of the quantity and quality of news coverage. In model 1 and model 2 of Panel A, we add LOWQQ and HIGHQQ, respectively, to essentially the same set of control variables used

in Table 6. Focusing on model 1 first, we note that the coefficient of LOWQQ is negative and statistically significant, while the coefficient of EXPOSURE is positive and statistically significant. This suggests that companies characterized by news coverage that is low in both quantity and quality (LOWQQ) are associated with lower levels of stock turnover, but among such LOWQQ companies, those that have higher quality news coverage (i.e. higher values for EXPOSURE) are associated with higher levels of stock turnover.

Moving onto model 2 in Panel A of Table 7, it is noted that the coefficients of HIGHQQ and EXPOSURE are both positive and statistically significant (at the 9% level for EXPOSURE). This suggests that companies characterized by news coverage that is high in both quantity and quality (HIGHQQ) are associated with higher levels of stock turnover (after controlling for such factors as firm size and systematic risk), but even among such HIGHQQ companies, those that have higher quality news coverage are associated with higher levels of stock turnover. In other words, the quality of news coverage appears to have incremental explanatory power over and above what is conveyed by the threshold quantity and quality of news coverage.

Model 3 and mode 4 in Panel A of Table 7 differ from model 1 and model 2 in that we add the ratio of tradable shares to total shares and replace the two profitability measures (ROE and VROE) with average daily return and return variance. The coefficient of LOWQQ in model 3 is negative and statistically significant, while the coefficient of EXPOSURE is positive and statistically significant (at the 3% level). This suggests that companies characterized by news coverage that is low in both quantity and quality are associated with lower levels of stock turnover, but among such companies, those that have higher quality news reports (i.e. higher values for EXPOSURE) are associated with higher levels of trading activity. In model 4, the coefficient of HIGHQQ is positive and statistically significant, indicating that companies which enjoy news coverage that is high in both quantity and quality are associated with higher levels of stock turnover. The coefficient of EXPOSURE, however, now loses statistical significance.

Models 5 through 8 in Panel A of Table 7 are the equivalents of models 1 through 4 with HITS replacing EXPOSURE. The consistent results that emerge from these alternative specifications may be summarized as follows: Companies that have news coverage that is high (low) in both quantity and quality are associated with higher (lower) levels of stock turnover; controlling for the quantity and quality of news coverage, those companies that have a larger quantity of news coverage (i.e. higher values for HITS) are associated with higher trading activity.

We further investigate the relative importance of the quantity and quality of news coverage in the context of trading activity by inserting in turn the two dummy variables, HIGHQTY_LOWQLY and HIGHQLY_LOWQTY, while retaining all the key control variables. The results are reported in Panel B of Table 7. Model 1 identifies a positive and statistically significant coefficient for both EXPOSURE and HIGHQTY_LOWQLY. Thus, firm-observations characterized by a large quantity of news coverage that is of low quality in content are associated with higher levels of stock turnover, relative to firm-observations characterized by news coverage that is not so high in quantity and not so low in quality. The positive coefficient of EXPOSURE suggests that among firms characterized by news coverage that is high in quantity and low in quality, those with relatively higher quality are associated with higher levels of stock turnover. This is consistent with the result in model 5 of Table 5.

Moving onto model 2 in Panel B of Table 7, it is noted that the coefficients of EXPOSURE and HIGHQLY_LOWQTY are both negative, but only the coefficient for the latter variable is statistically significant. The result here corroborates the result in model 6 of Table 5, where the relevant coefficients have a negative sign but are statistically insignificant. We interpret this to imply that having a small quantity of high quality news coverage does not make up for the few news reports that a company gets, and may even reduce stock turnover.

Model 3 and model 4 in Panel B of Table 7 are the equivalents of models 1 and 2 with HITS replacing EXPOSURE, and correspond to model 7 and model 8 in Table 5. The coefficients of HITS and HIGHQTY_LOWQLY in model 3 are both positive, but only the coefficient for the former variable is statistically significant. Thus, there is weak evidence here to suggest that having a large quantity of low quality news coverage is associated with higher levels of stock turnover. The coefficient of HIGHQLY_LOWQTY in model 4 is negative but has only marginal statistical significance. The result here corroborates the result in model 2 in the same table as well as model 8 in Table 5, and suggests that a small quantity of high quality news coverage does not quite make up for the few news reports that a company gets. The coefficient of HITS, which is positive and statistically significant, is consistent with this interpretation and suggests that among companies characterized by a small quantity of high quality news coverage, those with relatively larger quantities of news reports (i.e. higher values for HITS) are associated with higher levels of stock turnover.

Thus, the overall results in Table 7 using stock turnover as the dependent variable are broadly consistent with, and further reinforce, the findings in Table 5 and Table 6

using stock price informativeness as the dependent variable.

5.3. Checks on robustness

Apart from using the logistic transformation of $1-R^2$ as the dependent variable in the price informativeness tests, we also use raw R^2 and its logistic transformation as the dependent variable. In lieu of stock turnover as the dependent variable in the trading activity tests, we also use the natural log of the total number of shares traded and the natural log of the value of shares traded. Alternative measures for several explanatory variables are also tried. For example, instead of measuring leverage as the sum of short-term debt and long-term debt divided by the total market value of equity, we alternatively measure leverage as the sum of short-term debt and long-term debt divided by the book value of total assets. Instead of measuring age as the number of years since listing, we alternatively measure age as the number of years since establishment of the listed company. The results are qualitatively similar to those reported here and are thus omitted for brevity.

6. Summary and conclusion

This paper builds on the literature on the interrelations between firms' information environment, corporate governance, and media coverage. We argue that by reducing information asymmetries and increasing the transparency and visibility of companies, media coverage enhances the extent to which share prices incorporate firm-specific relative to market-wide information, and induces more active trading. Our empirical evidence from the Chinese stock market supports our hypotheses. We find that overall news coverage is positively associated with both stock price informativeness and stock turnover, and the relationship holds irrespective of whether media coverage is measured by the quantity of news coverage or the quality of news coverage.

In a first attempt to discriminate between the explanatory powers of the two alternative measures of news coverage (and hence the competing hypotheses whether media coverage provides value-relevant information or simply grabs investors' attention), we find that companies with news coverage that is high (low) in both quantity and quality are associated with higher (lower) stock price informativeness and trading activity. We further find that for a given threshold level of quantity and quality of news coverage, the number of news reports (rough hits) has unambiguous incremental explanatory power for the relationship between news coverage and price informativeness as well as the relationship between news coverage and stock turnover. In contrast, the incremental

explanatory power of the content-analysis-based measure of news coverage (which counts not only the quantity but also the quality of news reports) appears more clear-cut in the case where the companies are characterized by news coverage that is low in both quantity and quality, but is less obvious in the case where the companies are characterized by news coverage that is high in both quantity and quality. We attempt to further discriminate between the explanatory powers of the content-analysis-based measure of news coverage and the simple frequency-count-based measure of news coverage by exploiting cases where companies have a high value for one and a low value for the other. The bulk of the results are generally consistent with the notion that, relative to the quality of news coverage, the quantity of news coverage has a greater impact on stock price informativeness and stock trading activity. This conclusion must, however, be considered tentative as the results may be affected by the lack of sufficient dispersion in our measure of the quality of news coverage compiled using a stratified random sampling procedure.

Overall, we conclude that media coverage plays an unambiguous positive role in enhancing stock price informativeness and trading activity in the emerging Chinese stock market, despite the various factors that may be cited as adversely affecting the role of the financial news media in China to perform an alternative corporate governance and public monitoring role. Future studies from other stock markets (especially from emerging stock markets where the media presumably have a particularly important role to play) should help to corroborate or re-evaluate our results. Given the increasing recognition of the role of media coverage and its increasing use in economics and financial research, further studies are warranted to more closely examine the construct validity and relative explanatory power of empirical measures of news coverage.

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Appendix: Measuring news coverage

Our goal is to compile an index of news coverage for each company each year by reading and counting the amount and kind of information contained in the news articles of *China Securities*. Given the large number of news articles in which a company is mentioned (this ranges from a dozen to a few hundred per year), a stratified random sampling method is adopted whereby we first randomly select one day per month during the period 2000-2006. All the news articles for each company on these days are then identified. The content analysis (with a news article being the unit of analysis) then proceeds as follows:

(1) A content analysis protocol (available from the authors on request) is devised whereby text information is classified into 13 categories (content variables) representing information identified by investors, financial analysts and textbook authors as useful in investment decision-making. These include discussions of current operations or future prospects, discussions relating to stock valuation (price, risk and return), quantitative forecasts of earnings or business performance, qualitative comments or commentary as to a stock's value or a company's performance, reports of corporate governance moves, litigation, liability or supervisory investigations, comparison with industry competitors, related party transactions, mergers, acquisitions or divestments/spin-offs, and a catch-all category. Note that this list of content variables is mutually exclusive and exhaustive but any news article may contain more than one of these categories of information.

(2) To ensure that the classification system is reliable in the sense of being consistent across coders, in the initial phase 2 research assistants (both university graduates with a degree in accounting or finance) are briefed on the research topic and the content analysis method. They are then assigned to independently read the same set of news articles for randomly selected companies and score the news articles based on whether they pertain to one of the aforesaid content variables. For example, if an article contains discussions on (or reference to) a company's current operations and next period's earnings forecast, these variables will each be awarded a score of one, and similarly for the other variables. Their scoring of each variable and each article is then analyzed for inter-coder reliability and intra-coder reliability in the manner described in Krippendorf (2004). The coding frame is refined and ambiguities eliminated until a high level of inter-coder reliability and intra-coder reliability is achieved. At that stage, the two assistants are assigned to read the news articles for overlapping sample firms. Given the huge amount of manual work involved, the

reading and scoring of news articles took approximately 1.5 years. Upon completion of the content analysis, inter-coder reliability is checked. Cohen's *kappa* ranges from 0.65 to 0.90, indicating "good to excellent" agreement (Krippendorf , 2004).

(3) For each news article, an aggregate news coverage score is compiled by taking a weighted sum of the scores across all the content variables. In the absence of a theory, we take the equally weighted average but different weighting schemes are used for a check on robustness. Our aggregation approach may be compared to that in La Porta et al.'s (1998) compilation of an anti-director rights index, the self-constructed measures of disclosure in Botosan (1997, 2000), and the corporate governance index used in Ferreira and Laux (2007).

(4) For each year, the news coverage measure for each firm is derived by summing the news coverage score for a given firm across all chosen days of the year. By construction, this measure reflects both the amount and kind (i.e. quantity and quality) of information contained the news reports. This contrasts with a simple frequency count of the number of news reports a company gets, a measure that basically ignores the "quality" or content of the news reports.

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Table 1: Summary statistics

VARIABLE	N	MEAN	MEDIAN	STD	MIN	MAX
AGE	8418	5.85	6.00	3.35	0.00	16.00
SIZE	8790	14.49	14.49	0.99	9.98	20.66
BETA	8790	1.06	1.08	0.25	-0.21	2.42
LEVERAGE	8165	0.62	0.40	1.06	0.00	24.55
MTB	8165	1.13	1.07	0.28	0.00	15.79
ROE	8163	-0.001	0.061	1.16	-23.96	3.71
VROE	5848	0.24	0.001	6.96	0.00	509.13
DRET	8790	0.00	-0.00	0.00	-0.01	0.01
VAR_DRET	8790	0.00	0.00	0.00	0.00	0.01
TRADABLE_R	7433	0.39	0.37	0.12	0.02	1.00
TURNOVER	8790	5.26	5.27	0.71	0.70	7.32
RSQ	8790	0.41	0.40	0.18	0.00	0.94
IV	8790	0.45	0.39	0.96	-2.81	7.61
EXPOSURE	8418	1.80	0.00	3.19	0.00	30.51
HITS	8418	41.78	34.00	34.39	0.00	472.00

Definitions:

AGE: Number of years since listing
SIZE: Annual average of log of monthly market capitalization of total shares outstanding
BETA: Ordinary Least Squares market-model beta estimated using daily returns in a given year
LEVERAGE: The sum of short-term debt and long-term debt divided by total market capitalization
MTB: Market-to-book ratio of equity. Negative values are set to zero and values above 1% are winsorised
ROE: Return on equity
VROE: Variance of ROE over the preceding 5 years
TRADABLE_R: Ratio of tradable to total shares
DRET: Average daily return in a given year
VAR_DRET: daily return variance
RSQ: R-squared from market-model estimated using daily returns in a given year
IV: Logistic transformation of RSQ (Equation 1)
TURNOVER: Annual average of log of total number of shares traded over number of tradable shares per month
EXPOSURE: Content-analysis based measure of news coverage per year (see Appendix)
HITS: Number of times a company is mentioned in the news in a given year

Table 2: Distribution of news coverage over time and across stock exchanges

Panel A: News coverage measures for overall sample

Year	EXPOSURE					HITS			
	N	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX
2000	1060	0.46	1.56	0.00	12.88	10.45	8.61	0.00	78.00
2001	1139	0.74	2.03	0.00	15.16	13.86	8.86	0.00	75.00
2002	1210	2.47	3.47	0.00	19.93	41.77	18.95	3.00	151.00
2003	1277	1.51	2.77	0.00	16.25	26.97	14.28	0.00	104.00
2004	1377	1.00	2.33	0.00	15.67	32.61	24.88	0.00	318.00
2005	1392	2.19	3.64	0.00	30.51	76.99	40.14	0.00	472.00
2006	1458	3.43	3.93	0.00	20.71	67.71	32.12	0.00	313.00

Panel B: News coverage measures for companies listed on the Shanghai Stock Exchange

Year	EXPOSURE					HITS			
	N	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX
2000	559	0.88	2.06	0.00	12.88	14.71	8.64	0.00	78.00
2001	637	1.19	2.44	0.00	15.16	16.96	9.74	0.00	75.00
2002	707	2.36	3.49	0.00	19.93	37.62	17.61	3.00	137.00
2003	774	1.49	2.76	0.00	16.25	25.99	14.08	0.00	100.00
2004	835	0.87	2.14	0.00	11.63	28.61	24.05	0.00	243.00
2005	838	2.02	3.60	0.00	30.51	74.15	41.86	1.00	472.00
2006	852	3.5	3.92	0.00	20.71	68.67	29.85	0.00	313.00

Panel C: News coverage measures for companies listed on the Shenzhen Stock Exchange

Year	EXPOSURE					HITS			
	N	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX
2000	501	0.00	0.00	0.00	0.00	5.70	5.56	0.00	44.00
2001	502	0.18	1.10	0.00	13.51	9.95	5.51	1.00	46.00
2002	503	2.63	3.44	0.00	16.06	47.60	19.25	14.00	151.00
2003	503	1.55	2.78	0.00	14.42	28.47	14.46	1.00	104.00
2004	542	1.21	2.61	0.00	15.67	38.77	24.91	1.00	318.00
2005	554	2.46	3.68	0.00	17.42	81.28	37.08	0.00	328.00
2006	606	3.33	3.95	0.00	20.68	66.38	35.04	0.00	275.00

See Table 1 for definition of the variables

Table 3: Correlation Matrix (Pearson Correlation Coefficients)

Variable	TURNOVER	EXPOSURE	HITS	LEVERAGE	MTB	SIZE	BETA	TRADABLE_R	ROE	VROE	DRET	VAR_DRET
IV	0.39***	0.06***	0.12***	0.09***	0.12***	0.04***	-0.21***	0.12	-0.02**	0.05***	0.39***	0.41***
TURNOVER		0.11***	0.25***	0.06***	0.06***	0.01	0.13***	-0.00	0.03***	0.01	0.46***	0.43***
EXPOSURE			0.41***	0.03***	0.04***	0.09***	0.00	0.06***	0.00	-0.00	0.14***	0.08***
HITS				0.05***	0.05***	0.02**	0.03***	0.11***	0.00	-0.00	0.19***	0.18***
LEVERAGE					-0.11***	-0.15***	0.02**	0.07***	-0.56***	0.07***	-0.05***	0.03***
MTB						0.07***	-0.08***	0.01	0.27***	0.08***	0.12***	0.09***
SIZE							-0.19***	-0.21***	0.13***	-0.04***	0.03***	-0.13***
BETA								0.04***	-0.04***	0.02*	0.00	0.07***
TRADABLE_R									-0.02**	-0.00	0.07***	0.00
ROE										-0.00	0.11***	-0.03***
VROE											0.01	0.01
DRET												0.43***

See Table 1 for definition of the variables

*, **, *** Significant at the 10%, 5%, 1% level

Table 4: The relationship between price informativeness and overall news coverage

This table reports estimates of coefficients of the annual time-series cross-sectional firm-level regression model:
IV=f (news coverage, profitability measures, MTB, SIZE, LEVERAGE, AGE, BETA, other controls) + e
P-values for t-statistics computed for the coefficients following White (1980) appear in brackets

Variable \ model	(1)	(2)	(3)	(4)	(5)	(6)
EXPOSURE	0.017	0.012	0.012			
	(0.00)	(0.00)	(0.00)			
HITS				0.003	0.005	0.005
				(0.00)	(0.00)	(0.00)
ROE		0.001	0.006		0.003	0.008
		(0.93)	(0.72)		(0.87)	(0.66)
VROE		0.003	0.004		0.003	0.004
		(0.00)	(0.00)		(0.00)	(0.00)
LEVERAGE		0.065	0.061		0.057	0.053
		(0.00)	(0.00)		(0.00)	(0.00)
MTB		0.271	0.169		0.227	0.127
		(0.00)	(0.00)		(0.00)	(0.00)
SIZE		0.065	-0.005		-0.000	-0.068
		(0.00)	(0.66)		(0.97)	(0.00)
DD		-0.255	-0.268		-0.249	-0.262
		(0.00)	(0.00)		(0.00)	(0.00)
AGE		0.003	0.009		0.005	0.011
		(0.35)	(0.01)		(0.00)	(0.00)
BETA			-1.043			-1.038
			(0.00)			(0.00)
EXCHANGE_DUM		0.049	0.049		0.081	0.080
		(0.00)	(0.00)		(0.00)	(0.00)
YEAR_DUM		YES	YES		YES	YES
INDUSTRY_DUM		YES	YES		YES	YES
ADJ R-SQUARED	1.00%	34.36%	43.26%	1.60%	35.72%	44.54%
OBS	8418	5832	5832	8418	5832	5832

Definition (see Table 1 for definition of the other variables):

DD: A dummy variable coded 1 if the company pays a dividend in a given year, otherwise 0

EXCHANGE_DUM: A dummy variable coded 1 if the share is listed in the Shanghai Stock Exchange, otherwise 0

YEAR_DUM: A dummy variable indicating the year in which the firm-observation appears. The year 2000 is the omitted reference.

INDUSTRY_DUM: A dummy variable indicating one of 13

industries. The industry “Agriculture, Forestry, Fisheries and Livestock” is the omitted reference category

Table 5: The relationship between price informativeness and the quantity and quality of news coverage

This table reports estimates of coefficients of the annual time-series cross-sectional firm-level regression model:
IV=f (news coverage, profitability measures, MTB, SIZE, leverage, age, beta, other controls) + e
P-values for t-statistics computed for the coefficients following White (1980) appear in brackets

Variable \ model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
EXPOSURE	0.007	0.003			0.013	-0.022		
	(0.03)	(0.46)			(0.00)	(0.28)		
HITS			0.005	0.003			0.007	0.004
			(0.00)	(0.00)			(0.00)	(0.00)
HIGHQQ		0.262		0.127				
		(0.00)		(0.00)				
LOWQQ	-0.188		-0.138					
	(0.00)		(0.00)					
HIGHQTY_LOWQLY					0.185		-0.062	
					(0.00)		(0.23)	
HIGHQLY_LOWQTY						-0.082		-0.034
						(0.45)		(0.70)
ROE	0.021	0.007	0.022	0.009	0.000	0.096	-0.000	0.094
	(0.33)	(0.72)	(0.29)	(0.65)	(0.97)	(0. 21)	(0.97)	(0.22)
VROE	0.003	0.004	0.004	0.004	0.004	0.039	0.004	0.037
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	(0.04)
LEVERAGE	0.067	0.068	0.059	0.065	0.053	0.005	0.048	-0.002
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.83)	(0.00)	(0.93)
MTB	0.164	0.160	0.125	0.139	0.212	0.082	0.191	0.061
	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.40)	(0.00)	(0.52)
SIZE	-0.006	-0.003	-0.069	-0.039	-0.007	-0.019	-0.035	-0.061
	(0.67)	(0.81)	(0.00)	(0.01)	(0.63)	(0.50)	(0.03)	(0.04)
DD	-0.318	-0.239	-0.309	-0.235	-0.225	-0.118	-0.224	-0.109
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
AGE	0.012	0.005	0.013	0.006	0.008	0.010	0.010	0.011
	(0.01)	(0.24)	(0.00)	(0.12)	(0.07)	(0.19)	(0.02)	(0.15)
BETA	-0.94	-1.02	-0.937	-1.02	-1.138	-1.179	-1.130	-1.171
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
EXCHANGE_DUM	0.042	0.045	0.062	0.059	0.062	0.025	0.086	0.048
	(0.05)	(0.02)	(0.00)	(0.00)	(0.00)	(0.53)	(0.00)	(0.22)
YEAR_DUM	YES	YES	YES	YES	YES	YES	YES	YES
INDUSTRY_DUM	YES	YES	YES	YES	YES	YES	YES	YES
ADJ R-SQUARED	42.23%	44.11%	43.33%	44.51%	46.23%	45.23%	46. 92%	46.21%
OBS	5832	4033	3788	4033	4484	1052	4484	1052

Definitions:

HIGHQQ: A dummy variable coded 1 if both EXPOSURE and

HITS are in the top 25%, and 0 if both EXPOSURE and HITS are below the median

LOWQQ: A dummy variable coded 1 if both EXPOSURE and HITS are in the bottom 25%, and 0 if both EXPOSURE and HITS are above the median

HIGHQTY_LOWQLY: A dummy variable coded 1 (0) if a firm-observation has a value for HITS that falls in the top 25% (lower 75%) and a value for EXPOSURE that falls in the bottom 25% (upper 50%)

HIGHQLY_LOWQTY: A dummy variable coded 1 (0) if a firm-observation has a value for EXPOSURE that falls in the top 25% (lower 25%) and a value for HITS that falls in the bottom 25% (upper 50%)

See Table 4 for definition of the other variables

Table 6: The relationship between turnover and overall news coverage

This table reports estimates of coefficients of the annual time-series cross-sectional firm-level regression model: TRADING=f (news coverage, profitability measures, MTB, SIZE, LEVERAGE, AGE, BETA, other controls) + e
P-values for t-statistics computed for the coefficients following White (1980) appear in brackets

Variable \ model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
EXPOSURE	0.017	0.011	0.0125	0.008				
	(0.00)	(0.00)	(0.00)	(0.00)				
HITS					0.005	0.004	0.006	0.005
					(0.00)	(0.00)	(0.00)	(0.00)
TRADABLE_R			-0.558	-0.425			-0.623	-0.478
			(0.00)	(0.00)			(0.00)	(0.00)
ROE		-0.015	-0.023			-0.011	-0.021	
		(0.27)	(0.11)			(0.43)	(0.14)	
VROE		-0.00	-0.000			-0.000	-0.00	
		(0.71)	(0.35)			(0.55)	(0.42)	
LEVERAGE		0.031	0.031	0.028		0.027	0.021	0.018
		(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.00)
MTB		0.025	0.083	0.073		0.006	0.033	0.038
		(0.37)	(0.00)	(0.00)		(0.81)	(0.27)	(0.09)
SIZE		-0.029	-0.064	-0.105		-0.086	-0.141	-0.166
		(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.00)
DD		-0.118	-0.083	-0.036		-0.101	-0.075	-0.038
		(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.00)
AGE		0.002	0.001	-0.029		0.006	0.004	-0.027
		(0.37)	(0.61)	(0.00)		(0.02)	(0.15)	(0.00)
BETA			0.237				0.242	
			(0.00)				(0.00)	
DRET				6.160				3.284
				(0.14)				(0.42)
VAR_DRET				252.09				247.77
				(0.00)				(0.00)
EXCHANGE_DUM		-0.012	-0.019	-0.008		0.017	0.009	0.006
		(0.32)	(0.14)	(0.43)		(0.16)	(0.47)	(0.52)
YEAR_DUM		YES	YES	YES		YES	YES	YES
INDUSTRY_DUM		YES	YES	YES		YES	YES	YES
ADJ R-SQUARED	1.20%	50.00%	53.99%	57.16%	6.57%	52.94%	56.47%	58.24%
OBS	8418	5832	5039	7244	8418	5832	5039	7277

See Table 4 for definition of the variables

Table 7: The relationship between turnover and the quantity and quality of news coverage

This table reports estimates of coefficients of the annual time-series cross-sectional firm-level regression model: TRADING=f (news coverage, profitability measures, MTB, SIZE, LEVERAGE, AGE, BETA, other controls) + e
P-values for t-statistics computed for the coefficients following White (1980) appear in brackets

Panel A: High quantity-high quality news coverage versus low quantity-low quality news coverage

Variable \ model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
EXPOSURE	0.007	0.006	0.004	0.000				
	(0.00)	(0.09)	(0.03)	(0.91)				
HITS					0.004	0.003	0.004	0.004
					(0.00)	(0.00)	(0.00)	(0.00)
HIGHQQ		0.223		0.239		0.114		0.089
		(0.00)		(0.00)		(0.00)		(0.00)
LOWQQ	-0.124		-0.137		-0.084		-0.087	
	(0.00)		(0.00)		(0.00)		(0.00)	
ROE	-0.021	-0.018			-0.019	-0.016		
	(0.15)	(0.25)			(0.18)	(0.29)		
VROE	-0.000	-0.000			-0.000	-0.000		
	(0.44)	(0.60)			(0.46)	(0.58)		
LEVERAGE	0.027	0.035	0.023	0.033	0.021	0.032	0.015	0.026
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
MTB	0.044	0.067	0.051	0.082	0.009	0.045	0.020	0.067
	(0.18)	(0.06)	(0.07)	(0.00)	(0.76)	(0.21)	(0.46)	(0.02)
SIZE	-0.009	-0.033	-0.107	-0.135	-0.063	-0.074	-0.162	-0.176
	(0.36)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
DD	-0.116	-0.128	-0.043	-0.049	-0.110	-0.124	-0.039	-0.053
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
AGE	-0.002	-0.000	-0.029	-0.029	-0.001	0.001	-0.028	-0.027
	(0.46)	(0.96)	(0.00)	(0.00)	(0.70)	(0.66)	(0.00)	(0.00)
BETA	0.283	0.256			0.286	0.256		
	(0.00)	(0.00)			(0.00)	(0.00)		
TRADABLE_R			-0.373	-0.470			-0.424	-0.488
			(0.00)	(0.00)			(0.00)	(0.00)
DRET			14.46	9.237			10.39	7.448
			(0.00)	(0.07)			(0.03)	(0.13)
VAR_DRET			216.02	227.87			213.01	229.48
			(0.00)	(0.00)			(0.00)	(0.00)
EXCHANGE_DUM	-0.017	0.005	-0.025	0.007	0.001	0.059	-0.017	0.013
	(0.24)	(0.68)	(0.05)	(0.54)	(0.94)	(0.00)	(0.17)	(0.29)
YEAR_DUM	YES	YES	YES	YES	YES	YES	YES	YES
INDUSTRY_DUM	YES	YES	YES	YES	YES	YES	YES	YES

ADJ R-SQUARED	58%	51%	62.27%	57.52%	59.76%	44.51%	63.52%	57.86%
OBS	3788	4033	4713	5117	3788	4033	4713	5117

Panel B: High quantity-low quality news coverage versus high quality-low quantity news coverage

Variable \ model	(1)	(2)	(3)	(4)
EXPOSURE	0.008	-0.002		
	(0.00)	(0.89)		
HITS			0.007	0.006
			(0.00)	(0.00)
HIGHQTY_LOWQLY	0.261		0.008	
	(0.00)		(0.84)	
HIGHQLY_LOWQTY		-0.287		-0.138
		(0.00)		(0.11)
TRADABLE_R	-0.652	-0.795	-0.702	-0.829
	(0.00)	(0.00)	(0.00)	(0.00)
BETA	0.188	0.422	0.198	0.432
	(0.00)	(0.00)	(0.00)	(0.00)
ROE	-0.0168	-0.038	-0.018	-0.032
	(0.29)	(0.61)	(0.23)	(0.67)
VROE	-0.000	-0.022	-0.000	-0.021
	(0.43)	(0.21)	(0.47)	(0.22)
LEVERAGE	0.025	0.041	0.019	0.032
	(0.00)	(0.12)	(0.02)	(0.22)
MTB	0.019	0.125	0.000	0.106
	(0.61)	(0.19)	(0.99)	(0.26)
SIZE	-0.108	-0.091	-0.0143	-0.144
	(0.00)	(0.00)	(0.00)	(0.00)
DD	-0.097	-0.091	-0.095	-0.088
	(0.00)	(0.02)	(0.00)	(0.03)
AGE	0.007	0.016	0.010	0.019
	(0.06)	(0.05)	(0.00)	(0.02)
EXCHANGE_DUM	-0.006	0.021	0.015	0.043
	(0.68)	(0.56)	(0.32)	(0.25)
YEAR_DUM	YES	YES	YES	YES
INDUSTRY_DUM	YES	YES	YES	YES
ADJ R-SQUARED	45.92%	28.36%	47.46%	30.92%
OBS	3920	910	3920	910

See Table 4 and Table 5 for definition of the variables