

Business failure and mass media: An analysis of media exposure in the context of delisting event

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ABSTRACT

It is understood that the mass media are a pervasive force in shaping the public's perceptions. This paper incorporates agenda-setting theory to explore whether and to what extent that the mass media can signal business failure. In an analysis of news coverage relating to Chinese underperforming listed firms over the period 2006-2017, it is demonstrated that firms whose stocks are put under "special treatment" status due to consecutive annual losses experience (*ST) greater news volume and lower news sentiment relative to other firms in the quarter in which the "delisting risk warning" announcements are made. Furthermore, *ST firms which are eventually delisted have a greater volume of news than other *ST firms, but we find no evidence that the sentiment of news relates to termination of listing. Our findings offer insights into the informativeness of the mass media and their agenda-setting effects in the business failure context.

Key words: mass media; media exposure; business failure; agenda-setting; delisting; sentiment analysis

1. INTRODUCTION

Scholars in the field of communication have long recognised the mass media's socio-economic imperative, which exerts widespread influence on individuals and society. For example, media attentiveness to policy issues offers the public accessible information about the political environment and activities. While the media framing may not be able to change individual opinions about a certain issue, it has an impact on their perception of the collective salience of the issue and the dominant view which prevails within their communities (Mutz & Soss, 1997). In addition to acting as an agent which reports reality, the mass media are one of the information systems that are involved in shaping opinions and affecting people's behaviour and social actions (Ball-Rokeach & DeFleur, 1976; Fombrun & Shanley, 1990). Through editorials and feature articles, the mass media set the agenda for the public by telling people what issues to think about, and more importantly, how to think about these issues (Carroll & McCombs, 2003).

In the business field, the mass media also play a critical role. Prior studies have discovered that media disclosures and narratives may affect stock returns (e.g. Fang & Peress, 2009), corporate reputation (e.g. Carroll & McCombs, 2003; Wartick, 1992), corporate social responsibility (e.g. Grafström & Windell, 2011; Zyglidopoulos, Georgiadis, Carroll, & Siegel, 2012) and the survival of an organisation in field-wide crisis (e.g. Desai, 2011). Extensive media coverage of particular firms, issues, or events implies a prominence in the public agenda which is likely to influence stakeholders' and the public's impressions of firms (Pollock & Rindova 2003). Moreover, given the presence of information asymmetry, stakeholders and onlookers largely rely on information intermediaries to make inferences and assessments about a firm and its status (Deephouse, 2000). The market will not react to

business events such as bankruptcy until relevant information is widely disseminated by major news media (Dawkins & Bamber, 1998).

For decades, scholars have been studying the antecedents and consequences of business failure. Yet the existing literature in organisational research has documented limited evidence regarding the role of the mass media in business failure. Prior studies tend to explore media views on failure causes (e.g. Johnson, 2000) and how firms react to failure by influencing media exposure (e.g. Desai, 2011; Zavyalova, Pfarrer, Reger, & Shapiro, 2012), but there is little discussion on how the behaviour of information intermediaries such as the mass media potentially reflect and connect with business failure events. Given the increasing attention on the mass media in the business arena, this study aims to address this lacuna in our understanding by exploring the role of the mass media in business failure events. We are particularly interested in media visibility and news sentiment of underperforming firms in the Chinese stock market¹.

The reason for our focus on the Chinese stock market is mainly because of its unique regulatory environment which provides a natural setting for testing media effects. Since the establishment of the Chinese stock market, various laws and regulations have been implemented in order to protect the interests of investors. Among them, the Rules Governing the Listing of Stocks on Shanghai Stock Exchange (2014) and the Rules Governing the Listing of Stocks on Shenzhen Stock Exchange (2014) both contain a provision called “special treatment”. For example, the relevant provision in Rules Governing the Listing of Stocks on Shanghai Stock Exchange (2014) states that the stock exchange will issue a “special treatment” in the form of a delisting risk warning (DRW) regarding the stocks of a

¹ In the management field, media visibility is often referred to as media attention (Zyglidopoulos et al., 2012). In this study, we follow this definition and use the term “media visibility” to denote the quantity and intensity of media coverage of a firm.

listed firm which has suffered two consecutive annual losses.² The DRW entails “putting a *ST before the short name of a stock to make a distinction from other stocks and imposing a five percent daily up and down limit” (Rules Governing the Listing of Stocks on Shanghai Stock Exchange, 2014, Chapter XIII, Section 1). In addition, a firm needs to announce the DRW on the trading day immediately preceding the date on which the DRW will be issued in relation to its stocks. The “special treatment” policy is used to highlight the risk represented by underperforming listed firms and to restrict trading in their stocks. Firms under the status of “special treatment” (*ST firms) with a further loss in the third fiscal-year will be suspended from listing and those firms that are still in the red in the fourth year will be terminated from listing. This policy is almost exclusive to the Chinese stock market (Jiang & Wang, 2008). In relation to this, we are able to test the informativeness of the mass media at the time of ST events and identify the differential impact of media exposure on delisted *ST firms as compared to that on non-delisted *ST firms.

This paper first contributes to the organisational study regarding business failure with an empirical analysis of how the mass media relate to firms’ underperformance. Specifically, we examine underperforming firms’ media exposure in terms of visibility and sentiment and how such media exposure relates to termination of listing. Through the theoretical development and empirical analysis, we provide a clearer picture of the role that the mass media play in the business failure context, which responds to the call for the investigation of the interdependency between firms and the mass media (Carroll & McCombs, 2003). Next, moving beyond using media narratives to identify failure causes (e.g. Johnson, 2000; Cardon,

² A special treatment may be either a DRW (putting a *ST before the short name of stocks) or other kinds of special treatment (putting an ST before the short name of stocks). The occurrence of consecutive annual losses is the dominating cause for special treatment (Jiang & Wang, 2008). In addition, stocks of firms could also be put into ST or *ST status upon the occurrence of other circumstances. See Rules Governing the Listing of Stocks on Shanghai Stock Exchange, 2014, Chapter XIII, Section 2. In this study, the issuance of special treatment is referred to as “ST event” and we use the term “*ST firms” to denote firms whose stocks are under special treatment due to consecutive annual losses.

Stevens, & Potter; 2011; Mantere, Aula, Schildt, & Vaara, 2013), our study adopts a sentiment analysis approach to investigate business news. Opinion mining enables us to detect the media sentimental orientations and also attitudes towards business events and thus explore their potential relation to business failure. In addition, we extend the strand of communication research by testing for agenda-setting relationships between the media and business failure. Our results indicate that the mass media form investors' perceived severity of firms' underperformance by selecting which firms to cover, but we find no evidence that the way the mass media frame the story relates to the survival of underperforming firms. The insights from this study advance our understanding of media exposure and agenda-setting in the business sphere.

The remainder of the article proceeds as follows. We first provide an overview of related literature on business failure and media exposure, based on which we develop our hypotheses. Data collection and the sentiment analysis approach are then presented, followed by results and discussions. The last section concludes.

2. RELATED LITERATURE AND HYPOTHESIS DEVELOPMENT

2.1 A Retrospective of Business Failure

In the current literature, business failure has been defined and operationalised in various ways. According to Ucbasaran, Shepherd, Lockett and Lyon (2013), the scope varies from being narrow, only covering bankruptcy, to broad, encompassing discontinuance of the business and discontinuance of ownership. While the bankruptcy view emphasises a firm's poor economic performance (Shepherd & Haynie, 2011), the discontinuance of business highlights cessation of operations and loss of identity (Amankwah-Amoah, 2016). Besides these, a broader definition views business failure as the discontinuance of ownership (Watson & Everett, 1996; Everett & Watson, 1998). This focuses on the exit of entrepreneurs who close

or sell the company due to insolvency (Shepherd, 2003), underperforming against owner's expectations (Gimeno, Folta, Cooper, & Woo, 1997; Ucbasaran, Westhead, Wright, & Flores, 2010) or personal reasons (e.g. retirement, health concerns, wishing to move on to another business or career opportunity).

In addition to business closure, a nuanced perspective on business failure considers the underperforming survival firms (Khelil, 2016). Such firms experience a downturn in business performance yet persist over a long period (Meyer & Zucker, 1989). Persistently underperforming firms may have greater destructive effects on resources allocation and utilisation than insolvent ones that exit the market and this may lead to damaging impacts on the economy (Baumol, 1996; DeTienne, Shepherd, & De Castro, 2008; Khelil, 2016). However, some entrepreneurs decide to continue a business despite the fact that the business falls short of expectations or thresholds for economic viability. Such persistence in underperforming firms and, on the opposite extreme, the dissolving or offloading of a business even when it is performing well, can be partly attributed to "entrepreneur's motivation, commitment and aspiration" (Khelil, 2016, pp.75). Explanations of business failure at the individual level focus on psychological factors, in particular the disappointment or lack of satisfaction elicited by gaps between actual performance and expectations (Cooper & Artz, 1995).

Going beyond the emotive approach, research on the antecedents of business failure has seen a clear divide between the voluntarist and the determinist perspectives (Khelil, 2016). The voluntarist perspective attributes failure to factors at the firm level. This approach, relying on the resource-based view and the upper-echelon perspective (see Amankwah-Amoah, 2016), suggests that the fundamental causes of failure are manager's perceptions, decisions and actions (Mellahi & Wilkinson, 2004). It argues that failure is a result of top management poor

performance, inaction and/or deficiencies in managerial resources, rather than the institutional and industrial constraints that all firms in the marketplace are confronted with. In sharp contrast, the determinist perspective posits a vital role for the external environment. This tranche of research assumes that organisations' leaders have little or no control over exogenous factors (Moulton, Thomas & Pruett, 1996) in the changing environment. Nevertheless, recent studies have recognised that these two polarised views in isolation offer limited explanation for business failure which calls for an integrative approach (Mellahi & Wilkinson, 2004). In this study, we follow an integrative view and a broader definition of business failure that covers underperforming organisations.

2.2 Mass Media Agenda-Setting

The mass media means, essentially, "any communication channel used to simultaneously reach a large number of people, including radio, TV, newspapers, magazines, billboards, films, recordings, books, the internet and smart media" (Wimmer & Dominick, 2013, pp.2). Mass communication researchers have concluded that the mass media have a significant influence on people through changing, reinforcing, or shaping their attitudes and behaviours (see e.g. Macnamara, 2003; Hindle & Klyver, 2007). These three schools of thought on media effects differentiate in terms of the power of the media in influencing audiences' behaviour and thinking. The bullet theory (Schramm, 1954), also known as the hypodermic-needle theory (Berlo, 1960) and the stimulus-response theory (DeFleur & Ball-Rokeach, 1982), emphasises that media institutions are very powerful and directly influence and change people's attitudes. On the contrary, the reinforcement theory (Klapper, 1960) disagrees concerning the media's social control and contends that the media have a very limited ability to change people's beliefs but can reinforce existing opinions and ideas. A third paradigm is a middle-of-the-road perspective which is known as the mass media

agenda-setting theory (McCombs & Shaw, 1972, 1993). This view advocates that media have no direct impact on people's views, but are able to shape people's perceptions and values rather than change them. The media "create public awareness and concern for certain issues" (Carroll, 2004, pp.10), and this is capable of influencing the salience of topics on the public agenda (Carroll & McCombs, 2003; McCombs, 2014).

There are three dimensions of media salience identified in the communication literature: attention, prominence and valence (Kiousis, 2004). Attention refers to the high visibility of an event or an entity in the media which is manifest in extensive reports or a considerable amount of space taken up (Carroll, 2004). Prominence is concerned with the placement and position of such news, such as front-page stories, news released by elite newspapers, size of the headline and length of a report. These two dimensions focus on the salience of issues, i.e., the central topics in news coverage which are also known as media objects (Carroll & McCombs, 2003). The third dimension, valence, is concerned with the effects of the affective attributes of news on media salience. It captures the emotional context, such as a positive or negative tone, and the tenor of description (Carroll, 2004; Kiousis, 2004).

2.3 Mass Media and Business Failure

Prior studies have already shifted attention towards media coverage in relation to understanding business performance. In the financial realm, media can influence the market by framing market events and this may facilitate the appearance of "irrational exuberance" (Shiller, 2015). Fang and Peress (2009) find that intense media coverage of stocks leads to a lower return. Similarly, Fang, Peress, and Zheng (2014) examine the relationship between mutual fund performance and media coverage and contend that the mass media affect the behaviour of professional investors. Indeed, the mass media as key disseminators of information reduce information asymmetry for the public (Zyglidopoulos et al., 2012), and

exert a great deal of influence on the construction of organisational identity (Gilpin, 2008) as well as on stakeholders' perceptions and behaviour (Einwiller, Carroll, & Korn, 2010).

It is not until recent years that studies on business failure sense-making start to focus on news content (Mantere et al., 2013). Through analysing the media narratives of chain store closing down events, Johnson (2000) finds that media frames are mainly operationalised to delineate attributions of causal responsibility with a tendency to emphasise internal reasons inherent in the organisation. This is in contrast to corporate reports which generally accentuate uncontrollable external forces. Williams (2013) suggests that press coverage particularly with the use of metaphor significantly affects investment decision making. By examining the tenor of the media coverage of toy companies after wrongdoing, Zavyalova et al. (2012) document a negative spillover effect that media sentiment of a focal firm is affected by the behaviour of other firms in the same industry. Taken together, the framing of stories on media may lead to distinct interpretations and views on managerial capabilities and activities (Vaara, 2002), and so appropriate information and communication might be a decisive factor in business survival (Frankowiak, 1992).

The primary research question addressed by this study is whether and to what extent media exposure relate to business failure. We first investigate the association between media visibility, measured as volume of news, and underperforming firms. On the one hand, the media tend to be selective about what to report, known as the media's gatekeeping bias, which is often driven by the media's self-interest in attracting readers (D'Alessio & Allen, 2000; Boyle & Hoeschen, 2001). In this sense, media visibility in the financial market tends to be a reflection of the audiences' focus on key events. Firms that are of interest to investors are more likely to be covered by the press (Miller, 2006). Particularly, the media tend to pay attention to firms with nonconforming behaviours (Pfarrer, Pollock, & Rindova, 2010). Li,

Ramesh, and Shen (2011) find that firms reporting losses or in the process of delisting are more likely to receive alerts from Dow Jones Newswires. As underperformance indicates a higher risk for market participants (Baumol, 1996; DeTienne et al., 2008; Khelil, 2016), underperforming firms may attract greater media attention than other firms. On the other hand, adverse effects may be introduced by intense media scrutiny which puts the underperforming firms in the public spotlight and thus restricts firm actions. As illustrated in previous discussions on mass media agenda-setting, attention and prominence contribute to media salience regarding a topic, and the sheer amount of news coverage serves as an information cue to the audiences about the relative importance of the topic in the media agenda. The news media, as information intermediaries, monitor firms' malfeasances (Miller, 2006), and widespread media exposure raises public attention and awareness of firms' underperformance. Facing the aforementioned delisting mechanism in the Chinese stock market, listed firms have strong incentives to manage their earnings so as to report a profit (Liu & Lu, 2007). Since earnings management is constrained by scrutiny from information intermediary agents (Yu, 2008), extensive media coverage may lead to greater scrutiny of earnings management for *ST firms and thus increase their costs of meeting earnings targets. Hence, we hypothesise that:

*Hypothesis 1a: The news visibility (volume) of *ST firms is greater than that of non-*ST listed firms in the quarter in which the DRW announcement is made.*

*Hypothesis 1b: *ST firms with greater news visibility (volume) in the quarter in which the DRW announcement is made are more likely to be terminated from listing.*

Another important element in media salience is valence. The media, as suggested in Cardon et al. (2011), may recount a firm's actions in a more accurate and comprehensive way than does the firm itself, and thus depict a community-based view of reality. The disclosure of

business information via news media provides the public and stakeholders with cues from which to make inferences about the attributions of past events, the present status and future developments. Media frames tend to explore aspects inherent in the organisation rather than uncontrollable external factors (Johnson, 2000). In contrast to corporate accounts (e.g. annual reports) controlled by stakeholder groups which may frame news in their own interests or in that of the communities they serve (Hunter, Van Wassenhove, Besiou, & Van Halderen, 2013), investigations by the mass media are expected to be more “neutral” and “un-interventional”. For firms that experience operational difficulties and managerial problems, the tone of the news can be expected to be negative if the news is a factual account.

In addition, communications via news media not only recount the stories but also convey feelings which are reflected in the tone or disposition of presentations (MacKuen & Coombs, 1981; McCombs & Ghanem, 2001). According to the agenda-setting theory discussed previously, the mass media exert an influence on people’s understanding of the topic salience via texts, statements and rhetoric. The tone of the mass media makes a significant impact on the perceived severity of a firm’s underperformance and on the perceived probability of its survival. A strong tone may lead to either overly optimistic or pessimistic views being held by stakeholders concerning a firm. Besides, opinions on the current performance of a firm expressed in news discourses carry meanings to audiences and can shape their interpretations of the information signals regarding the firm’s prospects. Such perceptions and impressions created by the mass media may shape market sentiment, opinions and/or beliefs, which further affect stakeholders’ decision making. Moreover, negative information is perceived as more reliable than positive information and investors react more strongly to negative news than to positive news (Epstein & Echnieder, 2008). Unfavourable media accounts of an underperforming firm may leave a negative impression with stakeholders, leading to a loss of current and potential investors. Taken together, we predict that underperforming firms with

unfavourable media accounts are more likely to experience negative outcomes such as termination of listing. The hypotheses are as follows:

*Hypothesis 2a: The news sentiment of *ST firms is more negative than that of non-*ST listed firms in the quarter in which the DRW announcement is made.*

*Hypothesis 2b: *ST firms with more negative news sentiment in the quarter in which the DRW announcement is made are more likely to be terminated from listing.*

3. DATA AND METHODS

3.1 Data and Sample

To investigate the association between media exposure and business failure, we focus on news related to listed firms in the Chinese stock market. As stated before, the reason we choose the Chinese stock market is that it provides us with an opportunity to compare media exposure among delisted firms, underperforming firms, and other firms. We start with news of A-share listed firms as issued by the Chinese press, including major newspapers, magazines, and websites, extracted from the Chinese Stock Market and Accounting Research (CSMAR) database over the period from January 2006 to March 2017³. We extract the title, date, author, content, and source of news items released in our sample period from CSMAR and then match it to each listed firm based on a separately constructed dataset containing the linkage between listed firms and news. Next, we manually eliminate declarative news without evaluation, including firm disclosures and announcements. News issued by brokerage firms, banks, investment consulting firms and other institutional investors are also removed since their incentives may be misaligned with those of other market participants (see, e.g.

³ The data on the linkage between news and listed firms start from 1997 but the coverage of the fiscal year 2005 is significantly insufficient (less than 10 per cent) compared to those of other fiscal years. Consequently, we are unable to link the news, as well as the sentiment, to listed firms. Thus, the sample period for this study is 2006 to mid-2017.

Bradshaw, 2011). Then we exclude news associated with more than one firm as we are unable to discern and process specific content for each related firm. The initial sample contains 215,944 pieces of news for 49,358 firm-quarters over our sample period. It is important to note that we require at least two pieces of news to calculate the average sentiment for each firm-quarter, which leads to a further loss of 16,267 items of news. We also obtain firms' financial information from CSMAR and the Wind Financial Database and delete 993 firm-quarter observations with missing values. The final sample comprises 194,293 items of news for 32,091 firm-quarters (2,722 listed firms). The line chart in Figure 1 presents the quarterly distribution of listed firms, and the bar chart shows the quarterly distribution of news related to listed firms.

Insert Figure 1 about here

We collect the announcement date of DRW from CSMAR and cross-check this with several other financial information sources including Cninfo (the official information disclosure platform of the Chinese stock exchanges), p5w.net, and the Wind Financial Database. We only include DRW announcements due to poor performance (i.e. two consecutive fiscal-year losses) in order to avoid noise. During the sample period, there are 594 such announcements issued by 445 listed firms. We match the DRW data to our sample of news items based on the stock ID and announcement time. 333 announcements by 280 firms are matched to our sample. As shown in Figure 2, most DRW announcements are made in the second quarter

which is consistent with the time limit for the release of periodic reports in the Chinese stock market.⁴

Insert Figure 2 about here

3.2 Sentiment Analysis

Sentiment analysis is a text mining technique which uses computational algorithms to extract and classify subjective and emotional information contained in text documents (Pang & Lee, 2004, 2008). We adopt a Support Vector Machine (SVM) machine learning approach to build a text classifier based on a set of manually labelled training documents (Pang, Lee, & Vaithyanathan, 2002) and then apply this to the unlabelled news items to identify their sentiment. SVM is widely used in text categorisation, and is highly effective and outperforms other classifiers (Pang, Lee, & Vaithyanathan, 2002). In particular, Tan and Zhang (2008) show that SVM performs the best in relation to Chinese sentiment analysis.

To train the classifier, the first step is to reduce the document complexity and transform the unstructured text data into a format available for machine learning and statistical analysis. We first segment the Chinese words using the Rwordseg package in R software and split the text of a document into a sequence of tokens describing the content (Feldman & Sanger 2007). Common Chinese stopwords are removed from the documents in order to reduce noise. To construct a training set for the SVM learner, we randomly select 300 pieces of news from our sample and manually assign labels of positive or negative to each item of news. This classification yields 190 positive and 110 negative news items for the training dataset. We

⁴ The Securities Law of the People's Republic of China (2014) mandates that listed firms should disclose their annual reports within four months after the end of a fiscal year.

then tune the SVM algorithm on the training set and conduct a ten-fold cross-validation to evaluate classification performance. The confusion matrix in Table 1 shows the correct classifications and the error types. Overall, the SVM classifier achieves an accuracy of 79.67%, a precision of 78.67%, a recall of 93.16%, and an F-measure of 85.30%⁵.

Insert Table 1 about here

The trained classifier is then applied to our sample and each piece of news is labelled as positive or negative with a confidence score ranging from zero to one. We extract the confidence score of the positive class as a proxy for the sentiment of documents. A higher score towards one means the news has a greater probability of conveying positive and favourable information, whereas a number closer to zero shows the news is more likely to have a negative and unfavourable tone.

3.3 Measures and Model Specifications

To examine the informativeness of the mass media, we first focus on news visibility (*LnNewsVolume*), measured as the natural logarithm of the number of news items for firm i in quarter q . Next, we examine the average sentiment of news (*NewsSentiment*), which is given by the average sentiment score of all news items related to firm i in quarter q . **ST* and *Delisting* are categorical variables, respectively indicating whether firm i has been issued a DRW and whether firm i is delisted afterwards due to continuous underperformance. We also control for firm-specific characteristics that may be associated with media exposure, including: logarithm of total assets (*Size*), return on equity (*ROE*), leverage (*Leverage*), and

⁵ We also train a Naïve Bayes classifier and compare its performance to the SVM classifier. The results show that the SVM classifier outperforms the Naïve Bayes classifier.

earnings per share (*EPS*). All control variables are one quarter lagged and measured at the end of quarter $q-1$. We first estimate model [1] and [2] to examine the informativeness of the press in the context of ST events:

$$\text{LnNewsVolume}_{i,q} = \alpha + \beta \times *ST_i + \gamma \times \text{Control}_{i,q-1} + \varepsilon \quad [1]$$

$$\text{NewsSentiment}_{i,q} = \alpha + \beta \times *ST_i + \gamma \times \text{Control}_{i,q-1} + \varepsilon \quad [2]$$

Additionally, to further examine the role of the media in the context of firm delisting events, we restrict our sample to firm-quarters with ST events. Among the 280 firms within the subsample, 5 are delisted afterwards. We deploy model [3] to see whether and to what extent the media can signal the delisting of *ST firms:

$$\begin{aligned} \text{Pr}(\text{Delisting})_i = & \alpha + \beta_1 \times \text{LnNewsVolume}_{i,q} + \beta_2 \times \text{NewsSentiment}_{i,q} + \\ & \gamma \times \text{Control}_{i,q-1} + \varepsilon \end{aligned} \quad [3]$$

4. RESULTS AND DISCUSSIONS

The descriptive statistics are summarised in Table 2. Overall, about 1 percent of our firm-quarter observations contain ST events and observations of delisted firms only account for 0.56 percent of the whole sample. The average sentiment has a mean value of 0.637. All control variables are winsorised at the top and bottom 1 percent of their distributions to mitigate the potential influence of outliers. To test our hypotheses, we first conduct a two-sample t-test. As shown in Panel A of Table 3, we compare the news volume and the average news sentiment between *ST and non-*ST firms. The results indicate higher news volume and lower news sentiment for *ST firms (both significant at the 0.01 level). This is in line with our speculation that *ST firms attract greater media attention and have lower news sentiment as compared to non-*ST firms. Likewise, we find some supporting evidence for

such differences existing between delisted and non-delisted *ST firms (Table 3, Panel B). *ST firms that are eventually delisted obtain greater media exposure in the quarter of the DRW announcement. The difference in news sentiment between these two groups of firms at the time of the DRW announcement is marginally significant.

Insert Table 2 about here

Insert Table 3 about here

We next perform OLS regressions to investigate the relationship between media exposure and *ST status. Table 4 presents the estimation results for Hypothesis 1a and Hypothesis 2a. We find strong effects of *ST status on news volume and sentiment ($p < 0.001$). The positive coefficient on *ST status in column 1 suggests that on average *ST firms have 27.4% more news coverage than non-*ST listed firms in the quarter of the DRW announcement. Besides, as shown in column 2, news sentiment is on average 0.051 lower among *ST firms as compared to other listed firms. These results provide supporting evidence for Hypothesis 1a and Hypothesis 2a, which are concerned with media informativeness around the time of DRW announcement. The media in this case play an informative role in identifying focus events and disclosing value relevant information to the public. This is manifest in the increased volume of news and the more negative tone expressed in the news regarding *ST firms. This is also suggestive of the media agenda-setting role in swaying audiences' attention and influencing the perceived salience of firm underperformance through extensive news coverage and stronger sentiment.

Insert Table 4 about here

Next, we focus on the delisted firms within the *ST group. To test Hypothesis 1b and Hypothesis 2b, we regress an indicator of termination of listing on news volume and news sentiment and a vector of control variables. The results are presented in Table 5. Consistent with our expectation, the volume of news is significantly and positively associated with the delisting of a firm ($p = 0.030$ and $p = 0.038$ in column 1 and 3 respectively), suggesting that delisted firms have greater media visibility in the quarter in which the DRW announcement is made. As previously discussed, *ST firms that are delisted afterwards may experience severer business difficulties than other *ST firms at the time of their DRW announcements and are thus more likely to attract media attention. Additionally, from a perspective of impression management, firms may leverage information intermediaries in order to develop intangible assets (Zavyalova et al., 2012). As such, firms facing severer difficulties may deliberately manage their media visibility in order to redeem their image in the perceptions of stakeholders, leading to an increase in media coverage.

Insert Table 5 about here

Next, as evident in column (2) and (3) of Table 5, the results do not document a significant association between the news sentiment of *ST firms and the probability of delisting ($p = 0.260$ and $p = 0.289$ in column 2 and 3 respectively). This is different from our presumption that news sentiment is lower for delisted firms in the quarter in which their DRW announcements are made, compared to that of surviving firms. A possible explanation for the

reduced sensitivity of media sentiment in the delisting events is that the media are intermediaries for disseminating information and their analytical skills, comprehensiveness of investigation, personal inclination, and familiarity with *ST firms vary considerably, leading to mixed sentiment in the news. Another concern is that, as discussed previously, underperforming firms may engage in impression management in order to be positively perceived by market participants and attract potential investors. Prior studies (e.g. Hooghiemstra, 2000) have long recognised the importance of impression management in improving a firm's reputation and the perceptions of its investors. In addition to corporate accounts, underperforming firms or relevant parties may try to influence and even manipulate media accounts, resulting in increased media sentiment and therefore mixed results.

5. CONCLUSIONS

This paper contributes to the organisational study by exploring the effects of media exposure on business failure. We attempt to answer the question of whether and to what extent the mass media relate to business failure. By comparing the media exposure of Chinese *ST listed firms in terms of visibility, we show that *ST firms have greater news volume in the quarter of the DRW announcement. Similarly, the news visibility of *ST firms that are eventually delisted is higher than that of other *ST firms. These findings indicate that *ST status and the probability of delisting are strongly related to news volume which confirms our hypotheses about the association of media visibility with firms' underperformance and terminations of listing. The mass media perform the function of an information intermediary by focusing on enterprises in distress and shifting public attention onto them. In addition, there is mixed evidence regarding the relationship between news sentiment and *ST status. Consistent with prior evidence (e.g. Li et al., 2011) on the information intermediary role of the media, we find that news sentiment is significantly unfavourable to *ST firms compared

to non-*ST firms. However, there is no significant difference in news sentiment between delisted *ST firms and other *ST firms. The reduced sensitivity could be reflective of underperforming firms' impression management incentives.

Our findings shed light on the informativeness of the mass media in relation to firm underperformance and delisting events and add to our knowledge about the agenda-setting function of the mass media in the context of business failure. However, our study is subject to several limitations. First, our analysis is restricted to the major news media in mainland China, and therefore generalising results by including social media could usefully be undertaken. Second, our results regarding the effect of news sentiment on delisted firms are based on a small sample, and should thus be interpreted with caution. Finally, it might be interesting for future studies to explore firms' active management of media exposure in the business failure context. Extending this study to the additional examination of firm-media interdependency would help further investigate media objectivity in providing value-relevant information.

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TABLES

Table 1. SVM Classifier Performance

	True positive	True negative
Predicted positive	177	48
Predicted negative	13	62
Accuracy	79.67%	
Precision (Positive predictive value)	78.67%	
Recall (True positive rate)	93.16%	
F1 score	85.30%	

Note: We use four commonly adopted measures of classification performance (see Netzer, Feldman, Goldenberg, & Fresko, 2012). Accuracy is measured as the percentage of correct predictions over the total number of documents. Precision is the proportion of extracted documents that are classified correctly. Recall is the proportion of documents that are extracted and classified correctly. F1 score is the harmonic mean of recall and precision, given by $F = 2 * \text{Precision} * \text{Recall} / (\text{Precision} + \text{Recall})$.

Table 2. Summary Statistics

Variables	N	M	SD	p25	p50	p75
Variables of interest						
LnNewsVolume	32091	1.453	0.719	0.693	1.386	1.946
NewsSentiment	32091	0.637	0.101	0.580	0.653	0.710
Delisting	32091	0.006	0.075	0	0	0
*ST	32091	0.010	0.101	0	0	0
Control variables						
Size	32091	21.720	1.360	20.820	21.590	22.420
ROE	32091	0.045	0.136	0.011	0.040	0.087
Leverage	32091	0.512	0.309	0.310	0.492	0.658
EPS	32091	0.225	0.395	0.023	0.131	0.337

Notes: All control variables are one quarter lagged and measured at the end of quarter $q-1$.

Table 3. T-test Results

PANEL A: Firms without *ST (ST = 0) and with *ST (ST = 1)						
Variables	*ST = 0		*ST = 1		T-test	
	M	SD	M	SD	t-value	p-value
LnNewsVolume	1.449	0.717	1.769	0.815	-8.087	0.000
NewsSentiment	0.638	0.101	0.525	0.098	20.461	0.000
Size	21.732	1.357	20.756	1.211	13.071	0.000
ROE	0.046	0.133	-0.039	0.292	11.447	0.000
Leverage	0.508	0.304	0.899	0.501	-23.163	0.000
EPS	0.229	0.395	-0.150	0.273	17.470	0.000

PANEL B: Non-delisted *ST Firms (Delisted = 0) and delisted *ST Firms (Delisted = 1)						
Variables	Delisted = 0		Delisted = 1		T-test	
	M	SD	M	SD	t-value	p-value
LnNewsVolume	1.753	0.806	2.654	0.880	-2.711	0.007
NewsSentiment	0.526	0.097	0.460	0.130	1.650	0.100
Size	20.752	1.205	20.970	1.644	-0.436	0.663
ROE	0.038	0.292	-0.088	0.318	0.414	0.679
Leverage	0.900	0.499	0.902	0.676	-0.017	0.986
EPS	-0.148	0.272	-0.245	0.349	0.861	0.390

Notes: All control variables are one quarter lagged and measured at the end of quarter $q-1$.

Table 4. Regression Analysis on Media Exposure and ST Events

	(1)	(2)
	LnNewsVolume	NewsSentiment
*ST	0.274*** [0.042]	-0.051*** [0.005]
Size	0.000 [0.011]	0.014*** [0.001]
ROE	-0.045 [0.045]	0.016*** [0.006]
Leverage	0.154*** [0.031]	-0.036*** [0.005]
EPS	0.002 [0.020]	0.030*** [0.003]
Firm-fixed effects	Yes	Yes
Quarter-fixed effects	Yes	Yes
<i>N</i>	32091	32091
<i>R</i> ²	0.343	0.372

Notes: This table reports the results of OLS regressions examining the association between media exposure and *ST status. The dependent variable in regression (1) is the logarithm of news volume and the dependent variable in regression (2) is news sentiment. Firm and Quarter fixed effects are included. All control variables are one quarter lagged and we report the *p*-values based on robust standard errors clustered by firm. Standard errors are shown in brackets. *, **, and *** denote $p < 0.1$, $p < 0.05$, $p < 0.01$, respectively.

Table 5. Regression Analysis on Media Exposure and Delisting

	(1)	(2)	(3)
	Delisting	Delisting	Delisting
LnNewsVolume	0.375** [0.173]		0.354** [0.170]
NewsSentiment		-2.668 [2.367]	-2.561 [2.414]
Size	0.012 [0.161]	0.054 [0.149]	0.047 [0.162]
ROE	-0.106 [0.391]	-0.196 [0.377]	-0.216 [0.399]
Leverage	-0.108 [0.392]	0.016 [0.375]	-0.072 [0.379]
EPS	-0.502 [0.388]	-0.514 [0.397]	-0.460 [0.379]
<i>N</i>	333	333	333
<i>pseudo R</i> ²	0.084	0.063	0.120

Notes: This table reports the results of probit regressions examining the association between media exposure and the probability of delisting. The dependent variable is an indicator of delisting, which equals 1 if a *ST firm is delisted afterwards and 0 otherwise. All control variables are one quarter lagged and we report the *p*-values based on robust standard errors clustered by firm. Standard errors are shown in brackets. *, **, and *** denote $p < 0.1$, $p < 0.05$, $p < 0.01$, respectively.

FIGURES

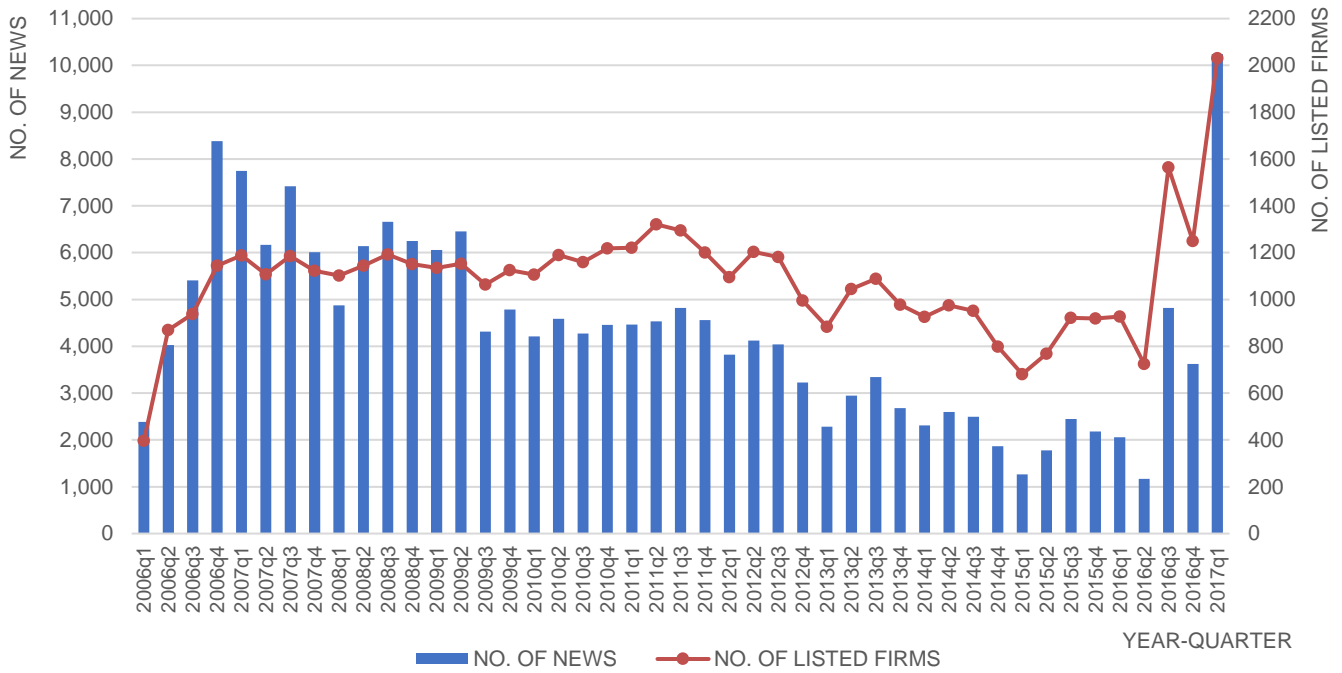


Figure 1. Quarterly Distribution of News and Listed Firms

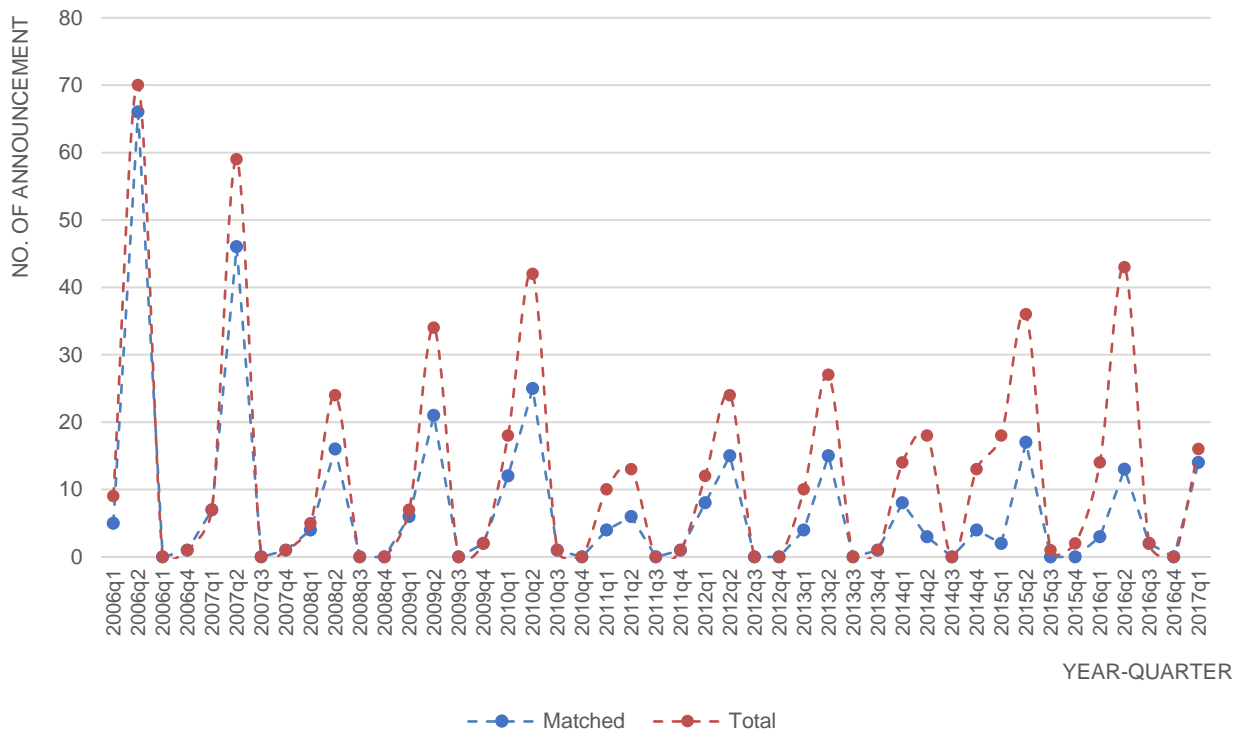


Figure 2. Quarterly Distribution of Announcements of Delisting Risk and Special Treatment