The tone and readability of the media during the financial crisis: Evidence from pre-IPO media coverage

Abstract

Prior research suggests that in an IPO market, where investors have little knowledge of IPO companies, the media plays a vital role in facilitating or inhibiting the process of impression formation. This paper examines the tone and readability of the media for IPO companies during the global financial crisis to understand the role of the media when the economic environment is uncertain. Our findings suggest that the tone but not the readability of the media varies under different market conditions. In particular, we find that the tone in the media is more favourable in good times, less so in bad. We suggest that the media is aware of the fact that positive (negative) news articles are more (less) likely to increase retail demand for a stock and, thus, try to hedge their bets during the crisis period and do not want to create unnecessary attention in an uncertain environment.

Keywords: Media; Financial Crisis; Tone; Readability; Positive; Negative; IPO.

1. Introduction

An Initial Public Offering (IPO) is considered to be a very significant event in the lifecycle of a company (Latham & Braun, 2010). Firms participating in an IPO are subject to numerous regulatory restrictions that prohibit them from certain activities while the company is in its registration period (Bradley, Jordan & Ritter, 2003).

In the US, the SEC regulates the disclosure of information by IPO firms during the IPO process. During the registration process, the SEC also restricts issuers, company insiders, analysts, and other parties from promoting the upcoming IPO. This quiet period restriction, coupled with the fact that such firms are still in their early periods of legitimising and therefore are largely unknown to retail investors, may lead to information asymmetry between issuers and investors. This puts the firm in a critical stage wherein it becomes difficult to establish an appropriate value for such an untried firm, especially for retail investors, implying the crucial role other sources such as media can play in facilitating information about the less known companies. This role can be even more important when there is an economic downturn such as a financial crisis.

Indeed, prior research (e.g. Bushee, Cedergren & Michels, 2017) shows that, during the 'quiet period', media plays a significant role for retail investors and such purchases are attention-driven rather than information based. In this paper, we provide novel evidence on how the pre-IPO media attributes (tone and readability) vary across different market conditions. Unlike other papers in this area, our paper examines the tone and readability of the pre-IPO media coverage when firms are still in the initial stages of legitimising, are largely unknown to retail investors and the economic environment is not favourable. This is where our contribution lies.

The sample consists of 76 news articles published between 2006 and 2009 for IPO companies listed on the NYSE. The time period was chosen to use the financial crisis as a natural experimental setting to examine the readability and tone of the media.

We find that the tone but not readability of the media changes under different market conditions. In particular, the media is more positive during the non-crisis period but more negative during the crisis period. We suggest that the media try to hedge their bets for less known companies in a difficult economic environment and try not to be positive which might create unnecessary attention for companies with little track record and incomplete information, especially among uninformed investors. Our empirical results suggest no variations in readability in the media with changing market conditions. Overall, we conclude that the media is more favourable in good times, less so in bad.

Our paper contributes to the existing literature in many ways. Numerous papers are available on market reaction and tone of annual and analysts' reports, but less so on the media which should be an important source of information for uninformed investors, especially for IPO companies during the global financial crisis. Indeed, prior research suggests that in an IPO market, where uninformed investors have little knowledge of IPO stocks, the media plays a vital role in facilitating or inhibiting the process of impression formation (Bushee et al. 2017; Pollock & Rindova, 2003). They also suggest that publicly available information on IPO firms not only enhances the legitimacy of IPO firms but also influences retail investor behaviour towards them. The impression formation process for IPO firms is highly critical as sufficient positive attention drawn towards the firm in the market is crucial for driving up the demand for its shares.

Second, our paper is timely for standard setters and the overall financial market. The lack of transparency in private exchanges (e.g. SharesPost and SecondMarket) for IPO stocks has drawn significant attention in the past, enhancing the requirement of an alternative

disclosure vehicle for IPO stocks. Since retail investors are desperate to obtain stocks such as Facebook, Twitter and Snap, they resort to trading these stocks before the company even goes public. This raises concern on how stocks are valued before the relevant data for the company is even available. The SEC is also concerned about secret commissions, hidden charges and investors being misled (WSJ, 2012).

Finally, our findings on the tone of the media during the crisis period shed light on the need for firms to take into account the importance of scheduling an IPO while carefully considering the state of the market.

The remainder of the paper is as follows: Section 2 discusses relevant literature and our predictions. Section 3 provides a discussion of research design followed by the results in Section 4. Section 5 concludes the paper.

2.0 Prior Research and Hypotheses Development

2.1 Prior Research

Prior research on IPOs and investor sentiment often makes a distinction between informed and uninformed investors where large institutional investors are seen as informed investors and individual retail investors as uninformed (Rock, 1986; Benveniste & Spindt, 1989; Keloharju & Torstila, 2002). Indeed, investors require resources and sophistication to analyse the value of an IPO and it is of no surprise that large institutional investors are considered as informed investors. These informed investors are able to better access the long- term value of the issuer whereas uninformed investors face the adverse selection problem.[1] Rock (1986) suggests that since uninformed investors are at an informational disadvantage compared to informed investors, they have the risk of gaining access to only low profit or unprofitable offerings. Derrien (2005) and Cornelli, Goldreich & Ljungqvist (2006), among others, theoretically show that issuers can take advantage of retail and sentiment investors.

In this regard, media plays an important role in facilitating (inhibiting) impressions of new companies about which uninformed investors lack firm-specific knowledge and face the risk of acquiring a large share of bad deals (Bushee et al. 2017; Engelberg & Parsons, 2011; Blankespoor, Haan & Zhu, 2017). Suchman (1995) concludes that by altering the levels of investor exposure to information about IPO companies and by framing this information *positively* or *negatively*, the media is capable of rendering some firms more desirable and comprehensible.[2]

[1] Malakhov (2013) suggests that informed investors are assumed to behave as an 'exclusive club' by colluding to protect their private information about the IPO value. On the other hand, uninformed investors help the issuer to better extract valuable pricing information from informed investors.
[2] See Liu, Sherman & Zhang (2014) for evidence of the influence of media on investor sentiment.

It is of little surprise that so much attention has been given in the literature to the impact of the media on financial markets (Cook, Kieschnick & Ness, 2006; Bhattacharya, Galpin, Ray & Yu, 2009; Tetlock, 2007; Tetlock, Saar-Tsechansky & Macskassy, 2008; Fang & Peress, 2009; Li, Ramesh & Shen, 2011; Dougal, Engelberg, Garcia & Parsons, 2012; Peress, 2014; Rogers, Skinner & Zechman, 2016; Blankespoor et al. 2017 among others)[3]. Prior research suggests that the media provides useful information to readers and helps to shape the expectations of market participants including investors. For instance, Kothari, Li & Short (2009) confirm that negative (positive) disclosures from the business press result in increased (reduced) cost of capital and return volatility. Similarly, Tetlock (2010) suggests that media content can serve as a proxy for investor sentiment. Tetlock (2010) also confirms that there is a significant effect of the tone used by influential market participants on stock prices. Specifically, he establishes the occurrence of a negative market reaction to pessimistic articles published in a Wall Street Journal column. Expanding on this concept, there has been a surge of research examining the significance of tone in shaping market reactions. Bushee, Core, Guay & Hamm (2010) confirm that the press serves a role in reducing information problems related to earnings announcements. Moreover, Wisniewski & Lambe (2012) find that journalists not only report on the state of economic reality during economic stress, but also play an active role in creating it. This shows that the media, which can serve as a proxy for investor sentiment, plays an important role in influencing the cost of issuing equity which has a direct effect on IPO volume.[4]

[3] Extant literature also shows how social structures enhance the flow of credible information to market participants to reduce the uncertainty of financial markets (e.g., Aldrich & Fiol, 1994; Zuckerman, 1999). Much research is also available on how information intermediaries, such as financial analysts and the media, influence these markets (Deephouse, 2000; Rao, Greve & Davis, 2001).

[4] Prior research also suggests that the media should be less prone to bias and optimism. For instance, Kothari et al. (2009) suggest that management and investment analysts can have strong incentives to optimistically skew disclosures, whereas news reporters' incentives to be optimistic in their reports are muted. In particular, they suggest that the credibility of media disclosures is higher than the credibility of disclosures made by company or financial analysts. In line with this, Li (2008) also confirms that the measures derived from content analysis for corporate disclosures are more likely to be *noisy* than those from the business press.

There is considerable research on the market timing of IPO suggesting both exogenous economic conditions and a firm's financing needs can influence an IPO decision. For example, Benninga, Helmantel & Sarig (2005) conclude that investment financing is not the only reason to launch an IPO. Likewise, Lowry (2003) suggests that economic recovery and investor optimism can encourage a corporation to launch an IPO. In particular, Lowry (2003) concludes that the IPO market serves as an economic indicator in both practice and academia due to its proven pro-cyclical nature. Accordingly, IPOs experience a *hot market* characterised by an increased number of firms going public and increased proceeds during an economic expansion, while during a recession, there are low levels of IPO activity, i.e., cold markets. Other studies (Dittmar & Thakor, 2006) also suggest that companies exploit favourable market conditions. Ernst &Young (2010) shows a considerable level of fluctuation in the number of IPO deals in the given time frame, i.e., a massive slump in the number of deals and amount of capital raised in 2008-09 as compared to the years directly preceding and succeeding them. This fluctuation is far in excess of the fluctuation in capital expenditures, indicating the presence of factors other than financing requirements to have a substantial effect on the timing of a firm's IPO (Lowry, 2003).[5]

Research on the role of media under different market conditions (e.g., internet bubble, financial crisis) is rare. While Shiller (2000) concludes that the media hype was a major factor responsible for the internet bubble, Bhattacharya et al. (2009) find that the media was more positive (negative) for internet IPOs in the period of dramatic rise (fall) in share prices. In summary, while prior research provides substantial evidence on the important role of the media during the IPO process and the importance of exogenous economic conditions for IPO firms, there is lack of evidence on how pre-IPO media tone and readability vary across different economic conditions.

[5] Lee, Shleifer & Thaler (1991) conclude that variations in investor sentiment have a significant impact on IPO volume. Also see Ritter & Welch (2002) for a review.

2.2 Hypotheses

Prior research suggests that by framing information on IPO stocks positively or negatively, the media is capable of rendering some firms more desirable and comprehensible (Suchman, 1995). Liu et al. (2014) find that pre-IPO media coverage is essential for a firm's information environment, enhancing its long-term value, liquidity, analysts' coverage and institutional ownership. The 'information hypothesis' suggests that positive news stories are most likely to trigger purchasing and, by contrast, negative news stories are less likely to increase retail demand for a stock. On the other hand, the 'attention hypothesis' suggests that both positive and negative news events should prompt retail buying.[6]

Shiller (2000) claims that the media hyped internet stocks during the dot.com bubble and this media hype was a major factor responsible for the dramatic rise and fall of internet stocks. He suggests that stocks price increases in the late 1990s were driven by irrational euphoria among individual investors and fed by an emphatic media, which catered to investor demand for pseudo-news (also see Bhattacharya et al. 2009). Because of the huge criticism in the recent past, it is not surprising that media will be more risk averse to avoid such criticism, especially when the market condition is poor. They should also be aware of the fact that it might create unnecessary attention to uninformed investors like the dot.com bubble. We therefore develop the following hypothesis.

H1: The pre-IPO media tone is more positive (negative) during non-crisis (crisis) periods.

While recent evidence suggests that media is important for investor sentiment in an IPO market, prior research also suggests that the effect of language sentiment (tone) is

[6] Barber and Odean (2008) suggest that attention-driven trade responds to the visibility of news articles but not the content.

conditional on readability. For instance, Tan, Wang & Zhou (2014) suggest that when readability is high, the substance of a disclosure can be easily understood and the language sentiment is less likely to have an impact on investor judgement, irrespective of *investor sophistication*. On the other hand, when the readability is low, language sentiment can have a marked effect on investor judgement, with the directional effect varying depending on investor sophistication level (Tan et al. 2014).

Understandability of disclosure is an important aspect for regulators. The International Accounting Standards Board (IASB) states, in its conceptual framework, that comparability, verifiability, timeliness and understandability are qualitative characteristics that enhance the usefulness of information (IASB, 2010). The IASB states,

> *Classifying, characterising and presenting information clearly and concisely makes it understandable. While some phenomena are inherently complex and cannot be made easy to understand, to exclude such information would make financial reports incomplete and potentially misleading. Financial reports are prepared for users who have a reasonable knowledge of business and economic activities and who review and analyse the information with diligence.*

In the US, the Financial Accounting Standards Board, in its conceptual framework, clearly states that information should be presented clearly and concisely to make it understandable. Equally, the SEC requires companies to follow plain English principles in order to facilitate investor understanding.

Empirical evidence suggests that companies do act in an opposite direction by providing low readability text. Li (2008) and Bloomfield (2008) suggest that managers provide low readability disclosures to obfuscate investors which ultimately results in reduced trading behaviour, smaller valuation change and muted investor reactions (You & Zhang 2009; Miller, 2010; Rennekamp, 2012). This must be a concern for uninformed investors, especially when there is more uncertainty about the market outlook and performance of companies. Likewise, we expect that the media provides more complex/ambiguous news

articles during the crisis period because of uncertain economic environment. Therefore, we develop the following hypothesis:

H2: Pre-IPO media articles are less (more) complex during non-crisis (crisis) periods.

3. Empirical measures and research design

We conduct a comprehensive content analysis to develop objective and reliable measures for the tone and readability of news articles. Tone is measured by manually classifying assertions made in news articles as favourable and unfavourable. The Janis-Fadner coefficient of imbalance which provides a measure of the overall tenor of media coverage (Pollock & Rindova, 2003; Deephouse, 2000; Janis & Fadner, 1965) was used to measure the tenor of the media. Readability is evaluated in terms of complexity using a commonly used measure of writing sophistication developed by Robert Gunning called the Gunning Fog Index. We are particularly interested to understand the readability of the media during the crisis and non-crisis period since prior research (Tan et al. 2014) suggests that the effect of language sentiment on investor judgement is conditional on readability. In line with Baginski, Demers, Kausar & Yu (2018) and Tan et al. (2014), since our sample media articles are readable (discussed later), we do not expect any differential impact of readability on tone between informed and uninformed investors.

3.1 Sample

Our sample consists of 76 news articles for 10 IPO stocks. The sample for the study was drawn from companies that listed on the NYSE between 2006 and 2009. The time frame

was chosen in order to analyse the impact of crisis on the reporting of media. We used Factiva and Lexis Nexis as main data sources for the articles. Approximately 48% of the news articles were taken from the Financial Times and the rest from Factiva which includes vendors such as Reuters, Dow Jones and the Wall Street Journal.

Panel A of Table 1 shows the sample selection process. Only news articles that were published *within* six months prior to the company's IPO date were taken. Companies with a minimum of two news articles available for the pre-IPO period were taken in the sample. Overall, 103 articles were collected and content analysed. Articles that simply discussed facts and figures such as IPO dates, list of underwriters without any analysis or not directly related to the company were excluded from the sample. Panel B of Table 1 shows the composition of the sample with respect to the industry each company belongs to and the number of articles analysed for that company. The sample includes companies from six industries: Basic Materials, Consumer Goods, Consumer Services, Financials, Technology and Telecommunications. Under this classification, the sample contains five companies with IPO dates falling in the non-crisis period and five companies with IPO dates falling in the crisis period. In terms of the number of articles, 33 articles were analysed from the non-crisis period and 43 articles were analysed from the crisis period.

INSERT TABLE 1 ABOUT HERE

To classify our sample into the non-crisis and crisis categories, an investigation of the important financial events that led to the global financial crisis was undertaken. Figure 1 shows the timeline of events that led to the global financial crisis.

According to Bloomberg, the timeline highlighting key dates of the financial meltdown which led to the global financial crisis suggests that one of the first signs that the

US housing market was turning sour was demonstrated on 8th February 2007 when HSBC revealed huge losses at its US mortgage arm. The second event magnifying the oncoming of the meltdown took place on 2nd April 2007 when New Century, a subprime lender filed for bankruptcy. On 9th August 2007, French bank BNP Paribas terminated withdrawals from three hedge funds. This sent credit markets into free-fall. This timeline is consistent with earlier studies such as Arand & Kerl (2012).

INSERT FIGURE 1 ABOUT HERE

3.2 Tone measure

The relevant content of each of the articles was identified and the assertions found in it were labelled as favourable (F) or unfavourable (U) as given in Appendix I. The tenor for each article was then calculated as positive, negative or neutral based on the number of favourable and unfavourable assertions. The number of positive articles (P), negative articles (N) and total articles (V) were noted for each company and used as inputs to the Janis-Fadner equation.[7]

This method is widely used in media-related research to assess the degree of media favourability (Deephouse, 2000; Pollock & Rindova, 2003). It measures the relative proportion of articles that have a positive tenor versus those with a negative tenor while controlling for the overall volume of articles for each company.

[7] The Janis-Fadner coefficient of imbalance is given by the following equation:

$$\frac{P^2-PN}{V^2} \; if \; P>N; 0 \; if \; P=N, and \; \frac{PN-N^2}{V^2} \; if \; P<N$$

where P is the number of positive articles about a firm, N is the number of negative articles and V is the total volume of articles, including articles that are neutral in tenor. The range of this variable is -1 to 1, where -1 equals all negative coverage and 1 equals all positive coverage.

In this study, news articles published by the media serve as the units of content that are classified on the basis of positive, negative and neutral tone which are then used as inputs to the Janis-Fadner equation. To arrive at the Janis-Fadner coefficient for each pre-IPO stock the following steps were carried out.

Step 1: The entire content of a news article was treated as the total content. The news article was then analysed to capture the relevant content, i.e., content which contained favourable or unfavourable assertions. The relevant content then consisted of the number of favourable and unfavourable assertions and was a subset of the total content.

Step 2: In the relevant content, if the favourable assertions outnumbered the unfavourable assertions, the total content (news article) was identified as *positive*. If the unfavourable assertions outnumbered the favourable assertions, the news article was identified as *negative*. If the number of favourable assertions and unfavourable assertions were equal in number, the news article was identified as *neutral*.

Step 3: For each company, the number of positive, negative and neutral articles were then calculated and used as inputs to the Janis-Fadner equation.

For analysing tone in each news article, we also examine: Number of favourable assertions[8] raised in the article (F); number of unfavourable assertions raised in the article (U); and Tenor of the article where T is inferred as Positive if favourable assertions exceed unfavourable assertions and vice versa.

The key features of the Janis-Fadner coefficient in this paper are: i) When, for a firm, there is an equal number of positive and negative articles, the coefficient has a meaningful zero value; ii) The coefficient has a positive (negative) value for firms that have a higher proportion of positive (negative) news articles; iii) When the number of positive (negative)

[8] We also analysed the assertions identified in each article as positive or negative based on the following set of rules: i) Paragraphs merely stating facts are not included in the analysis; ii) Paragraphs containing statistical estimates are not accounted for in a positive or negative light; iii) IPO related statistics such as the proceeds, the shares being floated, price revisions, ticker and exchange on which the stock will be listed are not included in the analysis.

tenor articles increases, the coefficient increases (decreases); and iv) When the number of articles increases, the coefficient decreases to adjust for the lower proportion of positive or negative articles that are now present.[9]

3.3 Readability Measure

Readability is broadly defined as the ease with which content can be read and understood. This study uses the degree of complexity as a measure of readability of news articles. To measure complexity, we use the Gunning Fog Index[10] that has been used extensively in computational linguistics literature, and has also gained prominence among accounting and finance researchers (Li, 2008; Biddle, Gilles & Rodrigo, 2009; Lehavy, Li & Merkley, 2011; Callen, Khan & Lu, 2013). We calculated the Gunning Fog Index (G-F) value for each article and the average complexity (A-C) of new articles for each company which is the average of the Fog Index values of all news articles available for that company during that period.

A key advantage of using the Fog Index is that it quantifies the measure of writing complexity in an objective and reliable way (Twedt & Rees, 2012). It is expected that a

[9] The coefficient of imbalance can be used to provide a measure of a certain trait provided the units of the content under analysis can be classified according to the occurrence of the particular trait, occurrence of its opposite trait and non-occurrence of the trait (Janis & Fadner, 1965).

[10] The Gunning Fog Index is used to measure the complexity of text and uses a readability formula which was developed by Robert Gunning in 1952. It measures the writing sophistication as a function of syllables per word and words per sentence and therefore provides an approximation of the years of education a reader requires in order to understand the text. The Gunning Fog Index calculates the readability of text by using the given formula:

$$G - F\ Index = 0.4 * \{\left(\frac{words}{sentences}\right) + 100\left(\frac{complex\ words}{words}\right)\}$$

where complex words are defined as words with three or more syllables. The output is a number and can be interpreted with respect to the Fog Index of 12 which requires the reading level of a US high school senior. A Fog Index below 12 is considered easy, in the range of 12–14 is considered average, 14–18 is relatively difficult, and above 18 indicates the document is unreadable (Gunning, 1968).

highly complex news article may signal a tendency to distract the reader from value-relevant information.

To provide additional evidence on the effect of crisis on the complexity of news articles, we also used the Flesch Reading Ease and Flesch-Kincaid Indexes – two other measures of writing complexity that have gained popularity (Dubay, 2007; Li, 2008). Similar to the Fog Index, the Kincaid Index calculates a grade level which is necessary for comprehension of a text. The Flesch Reading Ease Index, on the other hand, rates text on a scale of 100, with less complex text mapping to higher values. In order to make the interpretations of the various measures comparable, the Flesch Reading Ease Index is multiplied by -1 so that all measures represent higher complexity with larger values. The Flesch Reading Ease Formula is a simple approach to assess the grade-level of the reader although it has some limitations such as words of three letters or shorter count as single syllables and consecutive vowels count as one syllable.

4. Findings

4.1 Tone

Table 2 presents the Janis-Fadner coefficient of imbalance for each of the 10 companies in the sample. For the non-crisis period a total of 33 news articles were analysed for the five pre-IPO stocks. The Janis-Fadner coefficient was positive for all five stocks indicating high media favourability for the stocks. In the crisis period, 43 news articles were

analysed. The Janis-Fadner coefficient was found to be negative for all stocks with the exception of one (i.e., VMware).

For the non-crisis period, the mean and median value of the Janis-Fadner coefficient is 0.28 and 0.18 respectively, indicating significant favourable (or positive) coverage for the pre-IPO stocks. The standard deviation of the pre-IPO stocks covered in the non-crisis period is low when compared to the crisis period. Table 2 also shows that the mean and median values of the Janis-Fadner coefficient for all stocks in the crisis period is -0.11 and -0.23 respectively, indicating a decline in positive views by the media and an increase in negative views. There is also a larger standard deviation in the Janis-Fadner coefficient of these stocks indicating a larger variation in the Janis-Fadner coefficients during the crisis. This implies that the media tend to be more varied during the crisis, while showing both extreme ends of media favourability (i.e., Janis-Fadner coefficient of 1 for VMware) and media unfavourability (i.e., Janis Fadner coefficient of -1 for Cloud Peak Energy).

INSERT TABLE 2 ABOUT HERE

We also observed some interesting patterns in the individual company data. For example, Fortress Investment Group and Blackstone had their IPOs in February and June of 2007 respectively. The volume of articles (V) analysed for Fortress Investment Group was four. The Janis-Fadner coefficient of the company was 0.56, indicating a relatively high degree of media favourability. The number of favourable assertions (F) altogether in the four news articles was four for the company. No negative assertions (U) were observed. On the other hand, Blackstone had coverage of 18 news articles with a Janis-Fadner coefficient of -0.32, indicating more negative media coverage was drawn to its IPO. Overall, 30 of the 48 assertions were negative.

Table 3 shows a breakdown of the overall number of positive, neutral and negative articles in the non-crisis and crisis periods. In the non-crisis period, 55% of the articles were analysed as positive and 18% as negative. During the crisis period, although the number of positive articles dropped from 55% to 37%, the number of negative articles increased from 18% to 40%. [11] The ch-square statistic (x^2 =4.0586, p= 0.043946) shows a significance difference across two periods at 5% level.

INSERT TABLE 3 ABOUT HERE

Table 4 shows the number of positive and negative assertions raised in the relevant content of the articles during non-crisis and crisis periods. A total of 97 assertions were identified in the 33 articles analysed for the non-crisis period and 113 assertions were identified in the 43 articles analysed for the crisis period. In the non-crisis period the positive assertions were 30% more than the negative assertions and in the crisis period, the positive assertions were only 6% less than the negative assertions. The ch-square statistic (x^2= 7.6985, p= 0.005527) shows a significance difference across two periods at 5% level.

On the other hand, of the 33 news articles analysed for the non-crisis period, only 38 unfavourable assertions were raised compared to 60 non-favourable assertions in the 43 news articles analysed in the crisis period. This suggests an increase of 0.25 negative assertions per news article, i.e., from 1.15 negative assertions per news article in the non-crisis period to

[11] We also observed (unreported) that the number of articles with a neutral tenor remained almost the same across two periods.

1.40 negative assertions per news article in the crisis period. Overall, this signals a nominal increase in the negative views in the media during the crisis period.

INSERT TABLE 4 ABOUT HERE

Furthermore, for an article with a positive tenor, the number of positive assertions outnumbered the negative assertions by a higher number during non-crisis as compared to crisis. For example, in the non-crisis period, six articles were marked positive because the positive assertions outnumbered the negative assertions by more than two. Conversely, in the crisis period the positive assertions outnumbered the negative assertions by more than two only once. This, overall, indicates a higher degree of favourability in the non-crisis news articles as compared to the news articles published in the crisis period.

Similarly, for a negative tenor article, the number of negative assertions outnumbered the positive assertions by more than a difference of one on five occasions during the non-crisis and 11 occasions during the crisis period. This indicates a higher degree of unfavourability in the news articles published during the crisis period as compared to the news articles published in the non-crisis period.

Following the empirical observations given above, it can be inferred in favour of H1 that pre-media coverage is more favourable for IPO stocks during the non-crisis period. *First*, the highly positive Janis-Fadner coefficients of imbalance for each of the IPO stocks in the non-crisis period suggest high media favourability. *Second*, the percentage of news articles that are positive for the non-crisis period is significantly higher than the percentage of positive articles found in the crisis period. *Third*, the number of positive assertions per news article is much higher for the crisis period as compared to the non-crisis period. *Fourth*, for

positive articles, the positive assertions outnumbered the negative assertions by a higher amount in the non-crisis period as compared to the crisis period.

In contrast, the observations also suggest a significant decline in media favourability during a crisis period, except for VMware.[12] Furthermore, the number of negative articles was only 3% more than the number of positive articles in the crisis. The number of negative assertions per news article increased by 0.25 during the crisis as compared to the non-crisis period.

4.2 Readability

Panel A of Table 5 shows the average complexity (A-C) of the news articles published for each company during crisis and non-crisis periods. The values appear to be similar and fall within the average reading level with the exception of Vonage Holdings which falls into the category of relatively difficult readability. Seven news articles were analysed for Vonage Holdings of which five have a Gunning Fog index value of greater than 14.

INSERT TABLE 5 ABOUT HERE

Panel B of Table 5 presents the descriptive statistics for the Gunning Fog Index (F-I). The mean average complexity for all news articles published in the non-crisis period is 12.33 and in the crisis period is 12.57. Both these values are considered to be of an average readability level. The medians of both periods also fall within the average readability level. The variation in the complexities of the news articles across both the periods is also

[12] VMware is a US company that provides cloud and virtualization software and services. A Janis-Fadner coefficient of 1 for VMware may be explained by the nature of its business as virtualization is one of the fast growing areas in the technology sector.

insignificant as is demonstrated by the low standard deviation values. As seen in the table, 75% of the news articles fall below the 13.47 Fog index for the non-crisis period and 13.98 for the crisis period indicating the 75th percentile of the complexity values for both the periods falls within the average readability level. Furthermore, only 1% of the articles fall below the 8.08 Fog index level for the non-crisis period and below 8.34 for the crisis period indicating only a very small number of articles are less readable. Overall, we suggest that the news articles used in the sample are not overly complex and fall within the average readability levels. Overall, we did not find any support for H2, i.e., no evidence of varying levels of readability of the media across two periods.

The results of all the complexity measures used to analyse the news articles during non-crisis and crisis periods are presented in Table 6. The mean values for Flesch Reading Ease (F-R) and Flesch Kincaid (F-K) indexes fall within the average complexity range for both non-crisis and crisis periods, indicating a nearly identical result to the primary measure of complexity.

INSERT TABLE 6 ABOUT HERE

5. Concluding remarks

Prior research suggests that media can help retail or uninformed investors by generating and disseminating information about IPO companies with little track record (Bushee et al. 2017). We have limited understanding on how the pre-IPO media tone and readability vary during crisis and non-crisis periods. This paper presents interesting evidence of the readability and tone of the media during the last global financial crisis. The tone of the media while reporting for IPO stocks is hypothesised to be more positive during periods of non-crisis and more

negative during crisis. Readability is predicted to be less complex during periods of non-crisis and more complex during crisis.

Consistent with the predictions made for tone, media coverage is observed to be significantly positive during periods of non-crisis and negative during crisis. We do not find evidence of varying levels of readability of the media while reporting for IPO companies with changes in the market conditions. These results are continually observed using alternative measures of readability as well.

We believe the media tend to hedge their bets during the crisis period by providing more negative views as there is uncertainty in the market. More positive views might create excess attention which might be harmful for informed and uninformed investors alike. One plausible reason for this risk-averse attitude is due to the fact that the media is aware of the heavy criticisms they faced during the dot.com bubble (Shiller, 2000). This is also in line with the 'information hypothesis' (see Bushee et al. 2017), i.e., positive news stories are most likely to trigger purchasing and, by contrast, negative news stories are less likely to increase retail demand for a stock. We also find average readability of news articles which we interpret as an attempt from the media not to make it complex to uninformed retail investors across both periods and a tendency not to distract the reader from the information conveyed in the news articles. Overall, we conclude that, at least during the crisis period, the likelihood that uninformed investors were influenced by news articles that could be promotional in nature was low.

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