



# The impact of media coverage on IPO stock performance



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## ABSTRACT

This study uses signaling theory to examine the role of media coverage on IPO stock performance. Specifically, it investigates how coverage in *credible financial media* and *the tone of media coverage* about an IPO firm before and after its listing influence its stock performance. Results show that coverage in credible financial media about an IPO firm significantly impacts its stock price. Additionally, the findings show that uncertainty in the tone of media coverage about an IPO firm adversely influences its stock price. Overall, these findings contribute to signaling theory by addressing the impact of uncertain signals on investor behavior. Moreover, the findings reported in this study also contribute to the growing organizational literature on media by emphasizing the need for scholars to examine the content of media coverage, and specifically the role of uncertain media coverage, on firm-level variables.

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*“One of the oldest clichés on Wall Street is that markets hate uncertainty and confusion.”*

[E.S. Browning, Wall Street Journal, September 18, 2013]

## 1. Introduction

What factors influence changes in a firm's stock price after its IPO? Investors, investment bankers, the firm's managers, founders, owners (Gold, 2013), scholars in finance (e.g., Lowry, Officer, & Schwert, 2010), strategic management (e.g., Le, Kroll, & Walters, 2013), and entrepreneurship (e.g., Minardi, Ferrari, & AraujoTavares, 2013) have all sought to find answers to this question. Several studies have examined how factors such as corporate governance (e.g., Certo, Daily, & Dalton, 2001; Le et al., 2013), top management team characteristics (e.g., Liu, Li, Hesterly, & Cannella, 2012) and founder characteristics (e.g., Nelson, 2003) influence IPO performance. Although this research stream provides useful insights into the antecedents of IPO performance, these studies typically investigate factors that are at the firm level. However, investor opinions about IPOs are also shaped by factors outside of the firm such as the media (Pollock & Rindova, 2003). Therefore, scholars have started to explore how media coverage of IPO firms

influences their performance (e.g., Bhattacharya, Galpin, Ray, & Yu, 2009; Pollock & Rindova, 2003; Reuer & Tong, 2010).

Although the growing stream of research that examines the influence of media on IPO performance has provided valuable insights, this literature has two important limitations. First, these studies implicitly assume that all signals coming from different media sources are equally credible; however, this assumption runs counter to the existing evidence that media credibility is an important factor that affects how investors interpret media evidence (e.g., Dyck, Volchkova, & Zingales, 2008; Kothari, Li, & Short, 2009). That is, the organizational literature on media fails to take into account the role of credibility of media, which is defined as the degree to which IPO investors perceive the media source to be trustworthy.

Second, while previous studies have examined the positive or negative tone of media coverage about an IPO firm (e.g., Pollock & Rindova, 2003), media coverage about an IPO could be neither overtly positive nor negative (e.g., Pollock, Rindova, & Maggitti, 2008). That is, media may have a neutral or an uncertain tone in its coverage of IPO firms. Yet, little is known about how uncertain or ambiguous signals influence newly listed firms' stock performance. The lack of research attention to uncertain media coverage in IPO firms can be problematic because IPO firms, due to their lack of trading history, are subject to liability of market newness (Certo, 2003). Investors may view IPO firms as more volatile and uncertain than large established firms. If the media coverage about these firms is also uncertain, it could adversely impact its stock. Although a key tenet of signaling theory is that signals reduce uncertainty (Spence, 1973; Stiglitz, 2000), the theory does not address instances when the signals themselves are uncertain.

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This study uses signaling theory (Spence, 1973) to investigate the following research question: *How does the credibility (i.e., trustworthiness) of the media and uncertain tone of the media coverage about an IPO firm influence its stock market performance?* An uncertain tone in media coverage refers to the extent to which media signals constrain the ability of investors to predict the future movements of the stock price of the IPO firm. This notion is analogous to the concept of “state uncertainty”, defined by Milliken (1987).<sup>1</sup>

This study makes the following contributions to the literature on signaling theory and IPOs. First, we advance the organizational literature on media by investigating how uncertainty of media signals influences the stock price of IPO firms. Doing so complements previous studies that focus primarily on positive and negative signals coming from the media (e.g., Bednar, Boivie, & Prince, 2013; Pollock & Rindova, 2003; Tan, 2016). Similarly, in light of the evidence that media credibility affects investor reaction in the context of established firms (e.g., Dyck et al., 2008; Kothari et al., 2009), this study focuses on the role of credibility of media source on the stock price of IPO firms. As such, we challenge the implicit assumption in organizational literature on media that credibility of media source is a trivial factor. Specifically, the current study emphasizes the role that media credibility plays in shaping IPO firms' stock price. Second, the current study answers the call to apply signaling theory in settings other than that of large established firms (Connelly, Certo, Ireland, & Reutzel, 2011). Because media is one of the few sources that transmit signals about newly listed firms, the IPO context makes it easier to capture its role on investors' reaction. Further, although media coverage is one factor that affects investor behavior in both established (e.g., Fang & Peress, 2009) and IPO firms (e.g., Pollock & Rindova, 2003), media is likely to have an even more critical influence on IPO performance because of the lack of trading history for newly listed firms (Pollock et al., 2008). Third, unlike a majority of studies that use broad proxies to capture the role of media, such as the number of media mentions about an IPO firm (Pollock & Rindova 2003; Reuer & Tong, 2010), the current study examines the *content* of the media coverage about IPO firms. Doing so can provide a finer-grained contribution to the emerging research that examines the role of media on organizational outcomes. Fourth, a majority of studies in the literature focus on IPO firms' short-term (e.g., IPO underpricing – Filatotchev & Bishop, 2002) or long-term performance (yearly performance or survival – Minardi et al., 2013), with very little research examining factors influencing IPO performance in intermediate time frames. Even the studies that focus on intermediate IPO outcomes (e.g., Pollock & Rindova, 2003) fail to examine IPO stock performance one week after the listing date (See Moshirian, Ng, & Wu, 2010 for a notable exception). This limitation in the literature is certainly true for the strand of research that examines the role of media on IPO performance. Accordingly, this study makes an empirical contribution to the literature by examining IPO firms' intermediate performance through their stock returns one week after the IPO.

The authors chose to examine the stock return one week after the IPO date for three reasons. First, a firm completing an IPO is subject to a quiet period in which financial analysts that are affiliated with firms completing their IPOs are prohibited from issuing recommendations about them for a specified period of time (i.e., typically between 25 and 40 days after the IPO day). This means that until this period is over, underwriters or stock analysts cannot initiate research coverage on the IPO firm, thereby limiting IPO investors' access to information on the IPO firm (Bradley, Jordan, & Ritter, 2003). Accordingly, one week is a crucial period in which IPO investors would be likely to rely on media accounts to assess IPO firms' prospects. Second, Tetlock (2007) has shown that an average event that impacts investor sentiment typically reflects in the stock price the following week, but does

not last beyond one week. Accordingly, in the event of an IPO, examining the role of media in stock market performance for a one-week time frame appears reasonable. Third, several popular press outlets such as *Wall Street Journal* provide investors with an IPO calendar in which there is a list of all firms that are expected to complete an IPO in the present or coming week. Accordingly, IPO investors are likely to examine the press accounts of firms publicized in this and similar websites and pay particular attention to weekly media content.

## 2. Theoretical framework

### 2.1. Media and signaling theory

How media affects organizational outcomes has received increasing interest in the literature in recent years. For example, evidence shows that media influences strategic change (Bednar et al., 2013), capital allocation decisions (Liu & McConnell, 2013), corporate social responsibility practices (Zyglidopoulos, Georgiadis, Carroll, & Siegel, 2012) and stock returns (Fang & Peress, 2009; Tetlock, 2007). Since the work of Leland and Pyle (1977) and Ross (1977), several studies have used signaling theory in IPO research (e.g., Certo et al., 2001; Khoury, Junkunc, & Deeds, 2013; Mousa, Wales, & Harper, 2014; Sanders & Boivie, 2004). This paper examines the role of media in the IPO context from a signaling theory perspective.

Grounded in economics, signaling theory (Spence, 1973) examines how information asymmetry is reduced between two parties. Information asymmetry occurs when one party possesses more or better information than the other. When information asymmetry exists, one party (i.e., the signaler) can transmit signals to another (i.e., the receiver) to reduce information asymmetry. For example, in the context of job interviews, prospective candidates use their educational qualifications to signal their ability to employers (Spence, 1973). Signaling theory asserts that individuals pay special attention to the role of costs of information acquisition processes that alleviate information asymmetries. For example, individuals are most likely to rely on reliable and low-cost signals in the presence of asymmetric information. It is important to note that Spence (1973) originally assumed control over signals from the perspective of signalers. For example, Spence (1974:1107) defined signals as “alterable observable attributes.” However, in later applications of theory, several studies that use signaling theory showed that signals do not necessarily have to come from the signaler. For example, the literature shows that media, financial analysts, or other third parties often provide signals about firms (e.g., Daniel & Titman, 2006; Deephouse, 2000; Rindova & Fombrun, 1998). Similar to these studies, our focus in this study is not on signals provided by IPO firms but rather on signals provided by the media about IPO firms.

Although signaling theory originated in economics, it is widely used in management, particularly in the entrepreneurship literature (Connelly et al., 2011). The earlier entrepreneurship studies that used signaling theory found that entrepreneur-retained equity (Leland & Pyle, 1977) and financing strategy (Ross, 1977) can influence the perception of a firm's quality and in turn, its market valuation. Recent evidence shows that top management team legitimacy (Cohen & Dean, 2005), prestige of affiliated parties such as venture capitalists and underwriters (Pollock, Chen, Jackson, & Hambrick, 2010), and IPO social capital (Khoury et al., 2013) all serve as signals to investors about IPO firm quality.

The current study postulates that media coverage about an IPO firm serves as an important signal that investors use to form their impression about an IPO firm. There are three key rationales for this argument. First, signals sent through the media possess two characteristics that make them efficacious: observability (Goranova, Alessandri, Brandes, & Dharwadkar, 2007; Zhang & Wiersema, 2009) and low cost (Riley, 2001). Investors can easily detect the signals transmitted in the media; furthermore, advances in information technology and the internet have made it relatively inexpensive to access media reports. Both ease of observability and minimal cost of accessing signals sent through

<sup>1</sup> Milliken (1987:136) describes state uncertainty as follows: “Administrators experience state uncertainty when they perceive the organization environment, or a particular component of that environment, to be unpredictable”.

the media constitute a critical feature of its efficacy (Connelly et al., 2011). Second, media can help a firm gain legitimacy (Hoffman & Ocasio, 2001). According to Suchman (1995), an organization is perceived as legitimate when it is meaningful, understandable, predictable and trustworthy. Evidence shows that media facilitates investors' formation of understanding and impressions about IPO firms (Bhattacharya et al., 2009; Pollock & Rindova, 2003; Pollock et al., 2008). Media exposure provides information and circumstantial interpretations to investors and improves the visibility of the firm (Rindova, Petkova, & Kotha, 2007). Visibility of an IPO firm can enhance its status (Eisenhardt & Schoonhoven, 1996) and in turn, helps it gain legitimacy in the eyes of investors (Pollock & Gulati, 2007).

Finally, investors have limited information about IPO firms, since IPO firms are unlikely to have a long publicly-available history. For example, Chahine, Filatotchev and Zahra (2011) note that newly listed companies do not have an established track record and investors often have a hard time having access to information about these firms. Therefore, information in the media can substitute for the lack of publicly-available history of an IPO firm for investors. For example, media coverage could change the amount of 'money left on the table', defined as the first day profit received by investors who were allocated shares at the offer price (Ritter, 2011). The greater the information provided by the media, the greater the likelihood that IPO investors can better assess the intrinsic value of the firm. In short, media can correct the market failure associated with the information asymmetry in the IPO context.

## 2.2. Volume of credible financial media coverage before the listing and IPO stock return one week after the IPO

Lowry, Officer, and Schwert (2010) note that some IPO firms are broadly covered in the media even before filing an IPO while others receive little or no media coverage prior to an IPO. From a signaling theory perspective, the volume of information in the media is positively linked to signal frequency. Accordingly, repetitive signals can increase the effectiveness of the signaling process (Janney & Folta, 2003). For example, Filatotchev and Bishop (2002) document that the greater the signal frequency, the better investors' interpretation of IPO firms.

Although it is reasonable to think that media, acting as an information intermediary (Bushee, Core, Guay, & Hamm, 2010), will alleviate the information asymmetry between an IPO firm and investors, it is important to note that not all signals are equally valuable (Janney & Folta, 2003). In particular, signaling theory emphasizes the important role played by the credibility of signals in the process. According to signaling theory, the credibility of the signal is related to its honesty or fit. Fit is the extent to which the signaler actually has the unobservable quality being signaled (Connelly et al., 2011). A receiver of a signal is more likely to believe and agree with the signal if the source of the signal is considered trustworthy (Hovland & Weiss, 1951). Credible signals are more powerful in reducing the effects of information asymmetry (Kothari et al., 2009; Stiglitz, 2000). For example, in a sample of 92 biotechnology IPOs, Deeds, Decarolis, and Coombs (1997) find that the scientific capabilities of these ventures positively influence the total amount of capital raised but their R&D budgets did not. The authors argue that this is because IPO investors did not consider simple accounting data such as R&D spending as a credible signal, while they viewed scientific capabilities of the firm, a critical intangible asset for a biotechnology firm, as a credible signal that communicated the quality of the venture. Additionally, Ragozzino and Reuer (2007) report that the likelihood of an acquisition of an entrepreneurial firm following its IPO is greater for venture-backed firms than for firms without venture capital and that this effect is amplified when the investment bank of the IPO firm has a good reputation. The authors attribute this finding to the fact that both venture-capital backing and investment bank reputation at the time of the IPO are credible signals sent to potential acquirers. Other research grounded in signaling theory provides evidence that characteristics of top management team members (Cohen & Dean, 2005; Janney & Folta, 2003),

the structure of board of directors (Certo, 2003), auditor quality (e.g., Daily, Certo, Dalton, & Roengpitya, 2003), and customer quality (Reuber & Fischer, 2005) are all credible signals of the quality of an IPO firm.

Specifically, this study posits that coverage of an IPO in a credible financial source (e.g., the *Dow Jones*) can significantly shape IPO investors' investment decisions. The release of public information about firms – especially from a credible financial source – influences the decision of investors (Kothari et al., 2009; Mitchell & Mulherin, 1994). For example, Dyc, Volchkova and Zingales (2008) document that local newspapers' reports about the violation of minority shareholders' rights did not generate firm responses. The authors attribute this finding to the fact that local newspapers lack credibility. Consistent with these studies, this paper claims that the credibility of media coverage about an IPO firm one week before its listing date will matter even more in the context of IPO firms, given that less information is available for investors about these ventures. Investigating the role of media one week prior to the IPO date is particularly important for a few reasons. Both academic (e.g., Jenkinson, Morrison, & Wilhelm, 2006; Zattoni & Judge, 2012) and anecdotal (Taulli, 2014) evidence shows that beyond one week prior to the IPO date (i.e., two or three weeks before), there is less media coverage of IPO firms since during this time roadshows are done i.e., top managers of the IPO firm visit institutional investors to convince them to buy their shares. Accordingly, the media coverage of IPO firms before a month or a few weeks before the IPO is often restricted to generic information on these firms that could juxtapose with the information already included in a firm's prospectus. In addition, IPO firms that amend their prospectus often do so within one week prior to the IPO date. For example, Facebook amended its previous prospectus by adding a risk factor six days before its IPO date (Jennings, 2014). Since IPO investors pay close attention to the content of IPO firms' prospectus (Certo, 2003), one week time frame seems particularly relevant. At this stage, we do not make any assertion about the direction of the movement of the stock; we address this issue in a later section (and in Hypotheses 3 and 4). Thus,

**Hypothesis 1.** Coverage in credible financial media about an IPO firm one week before its listing date is significantly related to change in its stock price one week after the IPO.

## 2.3. Volume of credible financial media coverage after the listing and IPO stock return one week after the IPO

Although IPO firms technically become public after their listing date, the amount of publicly available information shortly after this date (e.g., one week) regarding the IPO firm is still limited. For example, IPO firms only need to disclose a general form for registration of securities under the Securities Act of 1933 immediately after their IPO. This form includes only selected balance sheet items from the previous three years. Although IPO investors could also use information included in the prospectus, it is important to keep in mind that the information included in the prospectus may be too generic for IPO investors to make an informed judgment about a particular IPO firm. In particular, information included in an IPO firm's prospectus is often limited to the summary of historical financial data, number of employees, competitive strengths, basic strategy formulation, principal investors, name of exchange agent, and risk factors.

Moreover, some of the information in the prospectus is subjective in nature (Bigelow, Lundmark, Parks, & Wuebker, 2014) and IPO firms have substantial discretion over what information is included. For example, under risk factors, most IPO firms note that the industry in which they operate is volatile and uncertainty in the economy and financial markets can adversely affect the success of the firm. Since these statements are common across most IPO firms' prospectuses, IPO investors may find such information of limited use in the valuation

of an IPO firm. In fact, Daily, Certo and Dalton (2005) found that the information contained in the prospectus is of limited use for investment bankers when they set IPO offer price or IPO offer price spread. Accordingly, IPO investors still need to wait a few months before IPO firms issue other proxy statements rich in information. This argument implies that for some time, investors may still have to rely on external sources for information. It therefore stands to reason that media news is an important source of information for IPO investors shortly after the listing date.

The arguments developed in support of the first hypothesis can also explain how the credibility of the media content about an IPO firm after its listing date will influence the IPO firm's stock price. As noted above, when the source of the signal is trustworthy, a receiver of a signal is more likely to believe and agree with the signal (Hovland & Weiss, 1951). Therefore, we propose:

**Hypothesis 2.** *Coverage in credible financial media about an IPO firm during the week after its listing date is significantly related to change in its stock price one week after the IPO.*

#### 2.4. Media sentiment before the listing and IPO stock return one week after the IPO

This study also examines the *content* of the media coverage. Given that previous studies have already provided some insights on the role of positive and negative signals transmitted by the media (Pollock & Rindova, 2003; Solomon, 2012; Tan, 2016), the current study investigates how the uncertain tone in media influences change in the stock prices of IPO firms. As previously stated, the tone of uncertainty in media coverage refers the extent to which media signals constrain the ability of IPO investors to predict the future movements of the stock price of the IPO firm (Milliken, 1987). IPO firms are likely to put a positive spin on their future prospects to convince investors to buy shares in their company and raise the highest possible amount of capital. From a signaling theory perspective, articles with an uncertain tone transmit uncertain signals to potential IPO investors. Thus, uncertain signals about an IPO firm prior to its listing date are likely to discourage IPO investors from buying the IPO firm's stock for several reasons.

First, when faced with uncertainty, individuals look for ways to avoid it or search for other alternatives. Simon (1947) notes that uncertainty can make decision-making process more complex and it can require more information gathering on the part of the decision maker. Therefore, IPO investors may postpone buying an IPO firm's stock when the information they receive from the media is uncertain. Second, decision makers tend to consider probable gains less completely than sure ones. The tendency to place a disproportionate weight on certain outcomes is referred to as the certainty effect (Kahneman & Lovallo, 1993). Previous studies show that the certainty effect is exacerbated when probabilities are uncertain or ambiguous (e.g., Hogarth & Einhorn, 1990). The certainty effect suggests that IPO investors are likely to underestimate the prospects of newly listed firms whose media coverage contain an uncertain tone and that investors are likely to overestimate the prospects of newly listed firms whose media coverage contain a more certain tone. This would result in lower demand for IPO firms that possess uncertain signals, thereby hurting the stock price of these firms.

Relatedly, Lester, Certo, Dalton, Dalton, and Cannella (2006) found that environmental dynamism is negatively related to investor valuation of IPO firms. Although this study examined uncertainty at the industry level, the same arguments would apply at the firm level for reasons explained above. Consequently, we expect:

**Hypothesis 3.** *The uncertainty of the tone of media coverage about an IPO firm one week prior to its listing date will have a negative impact on its stock price one week after the IPO.*

#### 2.5. Media sentiment after the listing and IPO stock return one week after the IPO

As noted before, once IPO firms start to trade on a stock exchange, the amount of publicly available information is still limited, suggesting that IPO investors would still pay close attention to media one week after the IPO listing date. Consistent with the arguments above, this study expects uncertain news in the media about an IPO firm following its listing date to negatively influence IPO stock return one week after the listing date. This is because uncertain signals transmitted from the media, coupled with the limited amount of information that the IPO firm discloses, cannot be of much use to investors. Thus, investors who did not buy the IPO firm's stock are unlikely to be attracted to the firm whose post-IPO media coverage has an uncertain tone.

Equally important, investors who already bought an IPO firm's stock can start to sell their shares when the information coming from the media is uncertain, since investors seek ways to mitigate uncertainty (Browning, 2013). More specific to the context of this discussion, Draho (2004: 255) notes that:

'An IPO that opens with a declining share price could suffer from a selling herd. An investor may sell his shares in the belief that other investors are selling their allocation. The information cascade that ensues causes a rush to sell, further exacerbating the price decline'.

The selling arising from uncertain news after the IPO listing date might create a herding or information cascade effect, where investors mimic the investment behavior of other investors (DiMaggio & Powell, 1991; Graham, 1999). For example, there is anecdotal evidence that investors of Twitter displayed a herding behavior shortly after its IPO date (Gold, 2013). Further, research suggests that herding behavior is common among IPO investors (e.g., Welch, 1992). Consequently, uncertain news in the first week following the IPO date may trigger a herding effect that could adversely impact stock price. Hence, we hypothesize:

**Hypothesis 4.** *The uncertainty of the tone of media coverage about an IPO firm one week after its listing date will have a negative impact on its stock price one week after the IPO.*

### 3. Methodology

#### 3.1. Sample

To test the hypotheses, this study uses data from all firms that completed an IPO on the NYSE or NASDAQ during 2006. The current study excludes the year 2007 and onwards because the *bear* investor sentiment, due to global financial crisis that started in 2007, could systematically influence the results. Similarly, the *bull* investor sentiment in 2004 and 2005 following the stock market crash in 2002 could have led media to have an overly positive tone about firms that completed an IPO during these years. Consistent with previous studies (e.g., Carpenter, Pollock, & Leary, 2003), this paper excludes firms that engaged in a corporate spin-off or were part of a financial fund (e.g., closed-end fund, trust fund, etc.) within a publicly traded firm as well as foreign listed IPO firms. Since the research question is about the role of credibility and tone of media coverage, the authors also excluded IPO firms that did not have information on their media coverage. To form the dataset, this study combines information from various data sources such as Factiva, Mergent, and Bloomberg databases as well as each IPO firm's web page. This procedure resulted in 97 firms that completed an IPO on the NYSE or NASDAQ in 2006. Due to missing data from 4 firms, the final sample size is 93 IPO firms.

### 3.2. Measures

#### 3.2.1. Independent variables

Consistent with previous studies (e.g., Bednar et al., 2013), this study uses the Factiva database to operationalize the volume of media-provided information about an IPO firm. The Factiva database provides media information on a particular firm for a specific period. The authors searched the media-related information for each IPO firm exactly one week before and one week after its IPO date. This procedure resulted in 1224 articles for the pre-IPO week and 1568 articles for the post-

IPO week. The authors used the percentage of news articles from *Dow Jones* sources (number of *Dow Jones* provided articles divided by total news articles provided by Factiva) to operationalize the credibility of the media. Examples of *Dow Jones* sources include the *Wall Street Journal*, *MarketWatch*, and *Dow Jones Newswires*. *Dow Jones* sources are frequently used as credible financial sources of media information in the literature (e.g., Dopuch et al., 1986; Tetlock, 2007).

Consistent with previous studies (e.g., Loughran & McDonald, 2013; Tetlock, Saar-Tsechansky, & Macskassy, 2008), the current study uses the ratio of uncertain words to total words to operationalize the

**Table 1**

List of words that are used to determine the uncertainty of media coverage, per Loughran & McDonald (2011)<sup>a</sup>.

Abeance	Contingently	Nonassessable	Reexamination	Undeterminable
Abeiances	Contingents	Occasionally	Reexamine	Undetermined
Almost	Could	Ordinarily	Reexamining	Undocumented
Alteration	Crossroad	Pending	Reinterpret	Unexpected
Alterations	Crossroads	Perhaps	Reinterpretation	Unexpectedly
Ambiguities	Depend	Possibilities	Reinterpretations	Unfamiliar
Ambiguity	Depended	Possibility	Reinterpreted	Unfamiliarity
Ambiguous	Dependence	Possible	Reinterpreting	Unforecasted
Anomalies	Dependencies	Possibly	Reinterprets	Unforeseen
Anomalous	Dependency	Precaution	Revise	Unguaranteed
Anomalously	Dependent	Precautionary	Revised	Unhedged
Anomaly	Depending	Precautions	Risk	Unidentifiable
Anticipate	Depends	Predict	Risked	Unidentified
Anticipated	Destabilizing	Predictability	Riskier	Unknown
Anticipates	Deviate	Predicted	Riskiest	Unknowns
Anticipating	Deviated	Predicting	Riskiness	Unobservable
Anticipation	Deviates	Prediction	Risking	Unplanned
Anticipations	Deviating	Predictions	Risks	Unpredictability
Apparent	Deviation	Predictive	Risky	Unpredictable
Apparently	Deviations	Predictor	Roughly	Unpredictably
Appear	Differ	Predictors	Rumors	Unpredicted
Appeared	Differed	Predicts	Seems	Unproved
Appearing	Differing	Preliminarily	Seldom	Unproven
Appears	Differs	Preliminary	Seldomly	Unquantifiable
Approximate	Doubt	Presumably	Sometime	Unquantified
Approximated	Doubted	Presume	Sometimes	Unreconciled
Approximately	Doubtful	Presumed	Somewhat	Unseasonable
Approximates	Doubts	Presumes	Somewhere	Unseasonably
Approximating	Exposure	Presuming	Speculate	Unsettled
Approximation	Exposures	Presumption	Speculated	Unspecific
Approximations	Fluctuate	Presumptions	Speculates	Unspecified
Arbitrarily	Fluctuated	Probabilistic	Speculating	Untested
Arbitrariness	Fluctuates	Probabilities	Speculation	Unusual
Arbitrary	Fluctuating	Probability	Speculations	Unusually
Assume	Fluctuations	Probable	Speculative	Unwritten
Assumed	Fluctuations	Probably	Speculatively	Vagaries
Assumes	Hidden	Random	Sporadic	Vague
Assuming	Hinges	Randomize	Sporadically	Vaguely
Assumption	Imprecise	Randomized	Sudden	Vagueness
Assumptions	Imprecision	Randomizes	Suddenly	Vaguenesses
Believe	Imprecisions	Randomizing	Suggest	Vaguer
Believed	Improbability	Randomly	Suggested	Vaguest
Believes	Improbable	Randomness	Suggesting	Variability
Believing	Incompleteness	Reassess	Suggests	Variable
Cautious	Indefinite	Reassessed	Susceptibility	Variables
Cautiously	Indefinitely	Reassesses	Tending	Variably
Cautiousness	Indefiniteness	Reassessing	Tentative	Variance
Clarification	Indeterminable	Reassessment	Tentatively	Variances
Clarifications	Indeterminate	Reassessments	Turbulence	Variants
Conceivable	Inexact	Recalculate	Uncertain	Variation
Conceivably	Inexactness	Recalculated	Uncertainly	Variations
Conditional	Instabilities	Recalculates	Uncertainties	Varied
Conditionally	Instability	Recalculating	Uncertainty	Varies
Confuses	Intangible	Recalculation	Unclear	Vary
Confusing	Intangibles	Recalculations	Unconfirmed	Varying
Confusingly	Likelihood	Reconsider	Undecided	Volatile
Confusion	May	Reconsidered	Undefined	Volatilities
Contingencies	Maybe	Reconsidering	Undesignated	Volatility
Contingency	Might	Reconsiders	Undetectable	
Contingent	Nearly			

<sup>a</sup> The above list of words was referenced in Loughran, T. & McDonald, B. 2011. When is a liability not a liability. *Journal of Finance*, 66: 35–65. The list of words can be accessed from Bill McDonald's webpage at [http://www3.nd.edu/~mcdonald/Word\\_Lists.html](http://www3.nd.edu/~mcdonald/Word_Lists.html).

uncertainty of the tone of media coverage. The list of words that convey uncertainty in the media was provided by Loughran and McDonald (2011) and was empirically validated to specifically apply to business and finance media. The list includes words such as ‘conditionally’, ‘doubtful’, ‘unexpected’, ‘volatility’ and ‘instability’. Table 1 includes the full list of words.

3.2.2. Dependent variable

The authors calculated stock price change one week after the IPO, the dependent variable, as the raw percentage change in stock price one week after the day of the IPO (e.g., Lowry et al., 2010).

3.2.3. Control variables

To rule out alternative explanations, this paper controls for several variables that previous studies found to be alternative determinants of IPO stock performance. At the firm level, this study controls for IPO firm size, measured as the logarithm of the number of employees (Scheufele, Haas, & Brosius, 2011), IPO firm age, measured as the difference in years between founding date and the IPO date (Mousa et al., 2014), whether the firm is listed in NYSE or NASDAQ by using a dummy variable (e.g., Loughran, 1993), whether the headquarters is located in the U.S. or in a foreign country (Hymer, 1976), whether the firm is backed by venture capital or other private equity backing (Minardi et al., 2013), firm sales prior to IPO (Le et al., 2013), prospectus risk factors (Pollock et al., 2008), offering size (Pollock et al., 2008), underwriter reputation (Pollock et al., 2008), media volume, and hot vs. cold IPOs (Aggarwal, 2003 - cold IPOs have raw returns on the first day that is less than or equal to 10%, and hot IPOs have raw returns on the first day >10%).

In addition, at the top management team level, the analyses control for whether the CEO is also the founder by using a dummy variable (Nelson, 2003). At the board level, the current study controls for board size, board age, and, board tenure, since IPO investors use these and other similar easily observable governance characteristics as potential signals when valuing a newly listed firm (Sanders & Boivie, 2004) and since these board characteristics influence the extent of agency problems in IPO firms (Mak & Roush, 2000). Lastly, following the approach of Le et al. (2013), industry was controlled for using a layered dummy variable for the first digit of the SIC code.

3.3. Results

Table 2 summarizes the descriptive statistics and the correlation matrix of all variables in the model. The variance inflation factors were all below 4, which indicates that multicollinearity was not a problem in the model. The method of analysis is hierarchical regression analysis. Consistent with this procedure, the authors first enter control variables and then add the independent variables to the model. Table 3 represents the results of the analyses.

Hypothesis 1 predicts a significant relationship between the coverage in credible financial media about an IPO firm one week before its listing date and its stock price change. Model 2 shows a positive and significant relationship ( $\beta = 8.96$ ;  $p < 0.05$ ) between credible financial media coverage one week before an IPO date and the stock price change, thereby providing empirical support for Hypothesis 1. Hypothesis 2 predicts that there is a significant relationship between the coverage in credible financial media about an IPO firm one week after its listing date and change in its stock price. This hypothesis is not empirically supported ( $\beta = 4.67$ ;  $p > 0.05$ ). Hypothesis 3 predicts that the uncertainty of the tone of media coverage about an IPO firm one week prior to its listing date has an adverse impact on its stock price. Model 4 displays a statistically significant ( $\beta = -11.50$ ;  $p < 0.05$ ) support for this hypothesis. Finally, Hypothesis 4 predicts that the uncertainty of the tone of media coverage about an IPO firm one week after its listing date is negatively related to IPO stock price change. Model 5 provides empirical support ( $\beta = -16.90$ ;  $p < 0.05$ ) for this hypothesis.

Table 2  
Correlation Matrix.

	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. IPO firm size	6.05	1.7																			
2. IPO firm age	7.4	888	0.00																		
3. Board size	6.01	2.15	0.16	-0.11																	
4. Board age	54.25	5.36	0.04	0.05	0.02																
5. Board tenure	2.04	1.98	-0.15	0.36	-0.02	-0.02															
6. NYSE vs NASDAQ	0.74	0.51	-0.28	-0.08	-0.17	-0.01	0.09														
7. Headquarter location	0.20	0.40	0.24	-0.07	0.14	-0.13	-0.16	0.03													
8. Founder CEO	0.14	0.35	0.00	-0.08	0.07	-0.15	0.17	-0.04	0.00												
9. VC- or PE-backed	0.30	0.46	0.13	-0.03	-0.07	-0.05	-0.04	-0.07	-0.12	0.04											
10. Media volume	12.73	12.31	0.35	0.08	0.07	-0.01	-0.12	-0.10	-0.04	-0.06	0.18										
11. Offering size	231	321.4	0.53	-0.19	0.28	0.07	-0.34	-0.23	0.15	-0.01	0.08	0.37									
12. Cold vs. hot IPO	0.09	0.29	0.18	0.09	0.06	-0.24	0.00	0.08	0.17	0.00	-0.07	-0.08	-0.06								
13. Underwriter reputation	6.28	5.54	-0.02	-0.11	-0.12	-0.14	-0.02	-0.15	-0.17	0.12	0.11	0.12	0.12	-0.02							
14. Sales growth prior to IPO	0.99	1.28	0.10	-0.10	-0.01	-0.31	-0.01	-0.19	0.21	0.21	0.15	-0.03	0.10	-0.12	0.22						
15. Risk factors	29.74	8.72	0.07	-0.32	0	-0.27	-0.16	-0.05	0.15	-0.06	0.02	0.03	0.07	0.01	0.05	0.03					
16. Credible financial media coverage (week before)	0.34	0.22	-0.11	-0.04	0.03	-0.03	0.07	0.00	0.00	-0.03	-0.04	0.02	-0.04	0.00	0.11	0.03	-0.04				
17. Credible financial media coverage (week after)	0.38	0.22	-0.07	0.07	0.08	0.13	0.22	0.01	-0.17	-0.12	0.09	-0.21	-0.17	-0.05	-0.09	-0.06	-0.04	0.46			
18. Uncertain media coverage (week before)	0.21	0.18	-0.03	-0.05	0.20	-0.02	-0.03	-0.12	-0.01	0.07	-0.06	0.13	0.03	-0.08	-0.10	0.05	-0.14	-0.28	-0.25		
19. Uncertain media coverage (week after)	0.24	0.13	-0.05	0.25	-0.05	0.11	0.10	0.04	-0.02	-0.10	0.00	0.15	-0.04	0.02	0.00	0.19	-0.08	-0.12	-0.18	0.27	
20. Weekly stock price change	0.10	7.57	-0.07	-0.07	-0.09	-0.07	-0.07	0.12	0.01	0.06	-0.21	-0.16	-0.17	0.12	-0.02	-0.24	-0.01	0.25	0.11	-0.17	-0.27

N = 93; correlation coefficients with an absolute value >0.18 are statistically significant at  $p < 0.10$  and those with an absolute value >0.21 are statistically significant at  $p < 0.05$ .

**Table 3**  
Results.

	Model 1	Model 2	Model 3	Model 4	Model 5
Control variables					
IPO firm size	−0.38 (0.67)	−0.19 (0.65)	−0.36 (0.64)	−0.60 (0.65)	−0.57 (0.62)
IPO firm age	−0.18 (0.11)	−0.16 (0.11)	−0.16 (0.11)	−0.22* (0.11)	−0.12* (0.11)
Board size	−0.10 (0.43)	−0.18 (0.42)	−0.12 (0.42)	−0.05 (0.42)	−0.05 (0.41)
Board age	−0.18 (0.18)	−0.17 (0.17)	−0.23 (0.17)	−0.20 (0.17)	−0.13 (0.17)
Board tenure	−0.58 (0.50)	−0.67 (0.49)	−0.66 (0.51)	−0.61 (0.49)	−0.44 (0.48)
NYSE vs. NASDAQ	1.10 (1.79)	1.17 (1.72)	1.24 (1.77)	0.60 (1.74)	1.85 (1.72)
Headquarter location	−0.20 (2.33)	−0.39 (2.25)	−0.32 (2.33)	−0.21 (2.33)	−0.53 (2.23)
Founder CEO	1.24 (2.53)	1.71 (2.45)	1.40 (2.52)	1.48 (2.45)	0.58 (2.42)
VC-backed	−6.53* (3.91)	−6.48* (3.77)	−7.02* (3.85)	−7.61** (3.80)	−6.27* (3.68)
Media volume	−0.02 (0.08)	−0.03 (0.08)	−0.07 (0.06)	0.02 (0.08)	−0.05 (0.06)
Offering size	−0.01 (0.00)	−0.01 (0.00)	−0.01 (0.00)	−0.01 (0.00)	−0.01 (0.00)
Cold vs. hot IPO	1.85 (3.36)	1.54 (3.25)	1.86 (3.28)	1.48 (3.25)	3.00 (3.19)
Underwriter reputation	0.06 (0.16)	0.02 (0.16)	0.08 (0.16)	0.01 (0.16)	0.08 (0.15)
Sales growth prior to IPO	−1.48* (0.84)	−1.48* (0.82)	−1.51* (0.83)	−1.34* (0.82)	−0.92 (0.83)
Risk factors	−0.09 (0.11)	−0.07 (0.11)	−0.09 (0.11)	−0.14 (0.11)	−0.08 (0.11)
Independent variables					
Credible financial media coverage (week before)		8.96** (3.59)			
Credible financial media coverage (week after)			4.67 (4.19)		
Uncertain media coverage (week before)				−11.50** (4.67)	
Uncertain media coverage (week after)					−16.90** (6.69)
Adjusted R <sup>2</sup>	0.02	0.09	0.04	0.08	0.11
Delta adjusted R <sup>2</sup>	−	0.07*	0.02	0.06*	0.09*
Model F	1.27	1.37	1.19	1.36	1.50

Standard errors are shown in parentheses; industry was controlled for but the coefficients of SIC codes are not reported (He, 2008).

\*  $p < 0.10$ .

\*\*  $p < 0.05$ .

### 3.4. Robustness tests

This study conducted a number of post hoc tests. First, in addition to the uncertainty of the tone of media coverage, the current study also tests the role of positivity and negativity of the media coverage on IPO stock performance. The results largely show that positive and negative news do not significantly influence IPO stock returns. Interestingly, negative news had a smaller negative impact (typically insignificant) on IPO returns than uncertain news. This finding emphasizes how much IPO investors dislike uncertainty. Specifically, due to certainty effect discussed earlier, IPO investors seem to dislike uncertain news more than negative news. Furthermore, it could be that signals coming from negative news coverage about an IPO firm may not necessarily discourage some investors to buy the IPO firm's stock simply because these investors may know from prior experience that media accounts sometimes exaggerate the reality. In fact, the literature on media shows that negative news is often exaggerated so that the media source receives more attention (Beedie & Bourne, 2005; Sonmez, 1998). Second, given that internet and technology stocks show higher first-day returns on average (Loughran & Ritter, 2000), the present study reran the analyses excluding stocks from the information technology industry (SIC codes 357, 366, 367, 481–484, 489, 732). The results did not change. Third, the authors collected additional data on the monthly stock price change of IPO firms to compare the role of media on weekly versus monthly stock price. Because of recency effect (Ebbinghaus, 1913), an individual's tendency to emphasize recent events compared to early ones, it could be that media would have a stronger influence on weekly than monthly stock price change. The results provided support for this prediction.

## 4. Discussion

This study examines the role of media coverage on IPO stock returns. In particular, by using signaling theory, it investigated how the *credibility* of media source and the *uncertainty* of the tone of media coverage about IPO firms influence stock returns one week after the IPO (the listing date). In short, the empirical results show that coverage in credible financial media about an IPO firm influences the firm's stock returns one

week after the IPO, and that the uncertain tone of the media coverage about an IPO firm largely hurts IPO stock returns one week after the listing date. The following section reviews how these findings make theoretical and practical contributions.

### 4.1. Theoretical and practical contributions

Whereas some scholars view media as an information intermediary (Bushee et al., 2010), others believe that media is simply a producer of entertainment, not information (Jensen, 1979). The findings reported in this study provide support for the former role of media in the context of IPO firms. This is not surprising, because the lack of a prior trading history of newly listed firms makes media one of the few sources of information that IPO investors can use to make a judgment on IPO firms (Pollock et al., 2008). However, in contexts where individuals have access to credible information via other sources than media (e.g., SEC filings), the information intermediary role of the media may become less important.

The first finding that coverage in credible financial media about an IPO firm significantly influences the firm's stock returns one week after the IPO (listing date) provides an important contribution to signaling theory, which has long emphasized signal credibility as a key concept of the signaling process. Specifically, the results provide empirical evidence to the basic tenet of signaling theory that credible signals influence actor behaviors. This issue (i.e., credibility of the financial media source) may become more critical as the media eco-system gets saturated with blogs, tweets, and new websites. Equally important, the results also show that the sentiment in the media coverage influences IPO stock price changes. Previous studies have mostly focused on negative and positive sentiment (e.g., Pollock & Rindova, 2003). The present study complements these earlier studies by examining the role of uncertain tone in media coverage. By embracing the assumption that markets dislike uncertainty (Browning, 2013), the authors argued that IPO investors would avoid investing in stocks of newly listed firms whose media coverage is uncertain. For the most part, the results provided empirical support for the idea that the greater the tone of uncertainty in media coverage about an IPO firm, the lower the stock return of the

IPO firm. This finding contributes to signaling theory, which does not specify how economic actors react to uncertain signals.

It is important to note that the results did not provide empirical support for the second hypothesis, implying that the role of credible financial media coverage after the IPO listing date has no statistically significant influence on IPO stock returns one week after the listing. One reason for this finding can be due to the herding behavior discussed earlier. Specifically, after the stock of an IPO starts to be traded, IPO investors may pay less attention to how credible the financial media sources are but instead may pay more attention to the investment behaviors of other investors. Alternatively, the market efficiency argument could be at play after the stock of an IPO starts to be traded. Namely, after a few days after the stock becomes traded, the market may already price the stock in an efficient way and the media may have minimal impact on the stock return of the IPO one week after the listing date. Our results imply that unless the media contains uncertain information about the IPO firm (hypothesis 4), IPO investors may not care that much about the coverage even in credible financial media after the IPO. That is, coverage in credible financial media seems to be critical before rather than after the IPO.

In terms of practical contributions, the findings reported in the present study stress the need for IPO firms to manage their media coverage. For example, whereas IPO firms may influence investor perceptions by sending them credible signals through their top management team members (Cohen & Dean, 2005; Mousa et al., 2014), it is possible that newly listed firms can also benefit from establishing a public relations department that can manage the information disseminated to investors. In particular, the results of this study show that an IPO firm experiences stock price increases to the extent that its coverage is coming from a credible financial media source and that it has lower uncertainty in the tone of media coverage. Accordingly, IPO firms may benefit from a coverage in credible financial media sources before their listing date.

#### 4.2. Limitations & future research

As with any study, this paper has certain limitations that point to potential new directions in future research. First, retail investors may rely more on media coverage than larger institutional investors, since the latter group of investors can receive information about an IPO firm's potential prospects from alternative sources other than the media (Scheufele et al., 2011). Although this argument begs the question of whether media coverage more strongly influences the returns of IPO firms whose stock is mostly held by retail investors than institutional investors, the authors could not empirically test this hypothesis due to the unavailability of data. Although the authors searched multiple databases and talked to individuals in the investment industry, they could not provide access to these data. Future researchers would benefit from investigating this issue in detail.

In addition, the results of the present study are limited by what news is included in the Factiva database. With the proliferation of informal media sources in the last decade, it would be beneficial for future researchers to include other informal or social media sources to capture the influence of these alternatives sources on IPO performance. Likewise, in order to keep the data collection task manageable, this study focused on coverage of news one week prior and one week after the IPO listing date. Future researchers can extend our work by studying how media coverage about an IPO firm beyond one week (e.g., a few weeks, a month) affects IPO performance. Although the choice of IPO stock market performance one week after the IPO is reasonable due to the quiet period as explained in the introduction, it is important to acknowledge that there is also a lockup period during which IPO firm insiders cannot sell the stock. After the expiration of the lockup period, which is often up to 90 to 180 days after the listing date, the stock market performance of the IPO can be substantially influenced by the insiders' selling activities. Moreover, the authors only examined uncertainty inherent in media coverage. Future researchers could

investigate other types of uncertainty in the context of IPO firms (e.g., uncertainty arising from the IPO market, uncertainty arising from macroeconomic conditions). A study of multiple types of uncertainty in the context of IPO firms could provide important insights to the literature. Furthermore, although we refer to previous studies (Dopuch et al., 1986; Tetlock, 2007) to determine credible financial media sources, there could be other financial media sources that IPO investors may consider credible. Similarly, there could be some local newspapers that probably use Dow Jones as their source. The non-availability of data precludes us from examining to what extent media coverage in such media outlets drive IPO returns. In spite of these limitations, the authors believe that this study provides a preliminary step to understanding how the media shapes investors' reaction to IPO firms' stock price changes.

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