News media coverage and initial public offerings in Germany: Explaining flotation performance

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Abstract

Purpose – The purpose of this paper is to investigate the relationships of news media coverage and the performance of initial public offerings (IPOs) in Germany. The aim is to find out how media attention, media sentiment, corporate information, and recency of news are related to the flotation performance of firms that go public.

Design/methodology/approach – 50 IPOs that went public in Germany between January 2011 and December 2015 were investigated. In total, 3,644 German speaking articles dealing with the IPOs were manually analyzed. Hierarchical OLS regressions were performed to find out how news media variables relate with the flotation performance of German IPOs (cf. underpricing, share price percentage gain after second day of trading). It was furthermore distinguished between news media coverage six days prior to the IPO and coverage on the day of the IPO itself.

Findings – While more media attention devoted to the IPOs on the day of their flotation might lead to a share price percentage gain after the second day of trading, negativity in the news media and information about new products and products of the IPO firm might be negatively related with their flotation performance. However, information about the strategy change of the IPO firms seems to be positively related with the underpricing of IPOs. Furthermore, news media coverage on the day of the IPO itself seems to be more influential for the flotation performance with regard to negative sentiment and information about new products.

Practical implications – Financial communication professionals should manage media representations of IPO firms before and on the day of the IPO itself. In this vein, negative media coverage should be prevented and information about new products and products of the IPO firm should be considered with caution. Instead, talking about the strategy of the IPO firm might be advantageous for the flotation performance.

Originality/value – This study evolved from a lack of empirical research on the interrelationships between news media and stock market prices in communication science, particularly with regard to IPOs. The study contributes to previous research in paying attention to corporate information and the recency of news when trying to explain IPO performances. The findings of this study provide implications for strategic financial communication and the role of managing news media of firms that go public.

Keywords Initial public offering (IPO), Financial markets, Investor relations, Financial reporting, Financial information, Stock markets, Investors

Paper type Research paper

Initial public offerings (IPOs) are exhilarating events for companies. During an IPO, the shares of a company are going to be publicly traded for the first time. This does not only cause the management of an IPO firm to tensely look forward to the stock performance on the first day of trading, going public also means a high level of uncertainty and excitement for institutional and private investors (Jang, 2007; Pollock and Rindova, 2003; Pollock *et al.*, 2008). While institutional investors oftentimes receive first-hand information during the roadshows of IPO firms, private investors primarily fall back on information distributed through the media to estimate the prospective market value of an IPO firm (Jang, 2007; Pollock *et al.*, 2008).

The role of media in influencing the stock market has been discussed widely in business and finance (e.g. Tetlock, 2007) but only to some extent in communication research (e.g. Strauß *et al.*, 2016). Moreover, research investigating the interrelationships between news media and IPO performances primarily stems from economics and finance research and has mainly drawn its attention to studying solely media attention and media sentiment

(e.g. Jang, 2007; Pollock and Rindova, 2003; Liu *et al.*, 2008). In so doing, previous studies have foregone the importance of focusing on specific corporate information when analyzing news media. However, for both academics and communication practitioners alike it is important to also know what kind of information might be relevant for investors in assessing the attractiveness of IPOs as investments.

Acknowledging the particularity of information and messages, communication science is predestined to contribute to this field of research by thoroughly studying media content for relevant corporate information and its subsequent effect on IPOs' stock market performances. We know from crisis communication, organizational, and marketing research that corporate crises (e.g. Coombs and Holladay, 2002), the management (Gaines-Ross, 2000), or the evaluation and introduction of products and innovations (e.g. Wies and Moorman, 2015) can have a considerable effect on corporate reputation and market performance of firms therewith. Hence, to scrutinize the relationships between corporate information and market performances of IPOs, this study investigates 50 IPOs that went public in Germany between January 2011 and December 2015. Germany, in fact, has proven itself to be a relevant market place for IPO research recently, given that the two internet firms Zalando and Rocket Internet have not only raised international attention regarding the long-awaited flotation in 2014 (Hegemann, 2014; Scott, 2014), but Deutsche Boerse, the German stock exchange, is also currently ranging among the ten most valuable stock exchanges in the world (Martin, 2016). Hence, our leading research question for this study reads:

RQ1. How does media coverage, and particularly the reporting on corporate information about IPOs, influence the performance of IPO shares in Germany in the first days of trading?

Theoretical framework
IPOs
An IPO is the technical term for describing the first time when a public investor can buy shares of a firm (Jang, 2007). While a more tacit objective of going public is to become more visible on the market and to develop a better reputation among the public, one of the main pecuniary aims is to raise capital for growth and thus achieve a good flotation performance (Kraus and Strömsten, 2012). The toolbox for this venture ranges from road shows, leaflets, and meetings with financial analysts and potential investors to common PR tools such as press releases or conferences (cf. Kraus and Strömsten, 2012). Given that media are prone to report on public relations material (Ragas *et al.*, 2011), media can be attributed a key role in augmenting the visibility, familiarity, and hence legitimacy of IPOs on the financial markets (cf. Pollock and Rindova, 2003).

The role of the media
Various scholars have argued that media coverage is related to stock market reactions (e.g. Davis, 2005; Tetlock, 2007). This assumption traces back to agenda-setting theory and the presumed effect of media representations on public opinion (e.g. McCombs, 1977), and more specifically within the corporate sphere (Ragas, 2012, 2013). In translating agenda-setting theory to the corporate world, media can "record public knowledge and opinions about firms and influence public knowledge and opinions about firms" (Deephouse, 2000, pp. 1094-1095). In that vein, organizational and management research has highlighted the importance of information mediators for the performance of firms (e.g. Fombrun and Shanley, 1990). Newspapers, and particularly financial reporting and analyst reports, are assumed to shape the public's image and legitimacy of firms, thereby affecting investors' trading decisions. Moreover, given that such news sources enjoy a high degree of reliability

and relevance (Lewis *et al.*, 2008), it is argued that they are likely to influence trading decisions by the vast majority of investors (e.g. Davis, 2005; Tetlock, 2007).

However, institutional investors receive relevant information on IPOs primarily through personal contacts (Davis, 2005; Jang, 2007). Nevertheless, there are two reasons why professional investors might rely on media coverage when making investment decisions after all. First, as Shiller (1995) contends, people in groups who share a common interest and consume a similar set of information (e.g. financial media), tend to think and act in a similar way, following a herd-like behavior (cf. Nofsinger, 2005; Prechter, 2001). Second, in order to anticipate the prevailing market opinion, investors tend to follow the consensus market opinion, which is assumed being reflected in the financial media (Davis, 2005; Shiller, 2000). Hence, the news media and the information environment surrounding the flotation of an IPO might influence whether both private and institutional investors decide to buy shares of a newly publicly traded company or not.

Media attention
Mass media has the power to disseminate information on firms to a broad audience; thereby evoking the attention investors might pay to these companies (Fang and Peress, 2009). From a general economic perspective, Shiller (2000) argues that media are predestined to attract investors' attention by reporting on stocks that have evinced a severe price change. This leads to further price fluctuations, which in turn comes along with further media coverage. Inferring from Shiller's positive feedback hypothesis, Jang (2007) assumes that prior media coverage on firms that go public might induce a hype about IPOs on the market.

While Bhattacharya *et al.* (2009) could not find evidence for such a media hype to explain the bubble for internet IPOs in the early 2000s, Jang (2007) concludes from his study that the more the media cover a newly listed stock, the greater the demand for that stock on the side of uninformed, private investors. In fact, Liu *et al.* (2008) find a positive relationship between media coverage during the filing period for IPOs and their underpricing. In line with these results, Fang and Peress (2009) as well as Barber and Odean (2008) have shown that particularly retail investors are prone to buy "attention-grabbing stocks" (Fang and Peress, 2009, p. 2026); hence, stocks that are more covered in the news.

Following this argumentation, information on IPOs that is distributed to a wide audience (i.e. via national news or online media) is likely to be consumed and acted upon by the majority of market participants. The more information there is available about an IPO, the more publicly known this IPO might become to the investment community, being reflected in increasing allocation of these stocks when going public. As a result, this might increase the difference of the stock market price of the IPO on the first day of trading to its emission price (i.e. underpricing). Furthermore, this relationship could be mirrored in a gain of the share price of the IPO after the second day of trading. It is thus assumed:

H1. The more attention media pay to an IPO (a) the higher the underpricing and (b) the higher the share price percentage gain of the IPO after the second day of trading.

Corporate sentiment
Based on attributed agenda-setting theory or second-level agenda-setting theory, media do not simply reflect facts on companies but they might also affect evaluations and opinions on these firms by the public (Carroll and McCombs, 2003; Deephouse, 2000). Thus, media can take a decisive role in spreading optimism or pessimism among the public and, hence, influencing the financial market (Nofsinger, 2005; Tetlock, 2007). More specifically, Carroll (2009) infers that media representations form an organization's reputation and the esteem hold toward the organization by the public. Assuming that corporate reputation might also

be related to market valuation (Fombrun and Shanley, 1990), media representations and the tone in coverage might also affect the flotation performance of newly listed firms.

Indeed, the market for IPOs is considered to be particularly "sensitive to sentiment" (Baker and Wurgler, 2006, p. 1656). John R. Nofsinger (2005), a behavioral finance scholar, for example, asserts that positive social mood might lead to "more M&A activity, IPOs, and capital spending several months later" (p. 145). Nofsinger's argument is that an improvement of social mood is reflected in optimism hold by investors and consumers, which is then played out on the stock market by means of increasing high-risk portfolios, the buying of stocks, and higher trading volume. On the other hand, Nofsinger contends that negative social mood is associated with consumer and market pessimism, which is echoed in falling stock market prices, more volatility and a turn toward less risky portfolios. With regard to the IPO market, he claims that there will be more IPOs and the initial returns of IPOs will be higher in times of optimism than compared to times of pessimism.

However, empirical findings on how positive or negative media coverage affects the performance of IPOs are limited. Only using a proxy for measuring positive media coverage (i.e. recent industry return), Liu *et al.* (2008) do not find any relationship between positive media coverage and the performance of an IPO in the long run. Accordingly, Pollock and Rindova (2003) only detect a moderately significant and positive relationship between media tenor and underpricing. On the other hand, Jang (2007) finds strong significant positive relationships between a more positive tenor and the level of underpricing over various pre-IPO coverage periods.

Following the tendencies of these findings and in order to obtain conclusive evidence about the power of positive and negative media sentiment in explaining flotation performance, we pose the following two hypotheses:

H2. The more positive media sentiment for an IPO (a) the higher the underpricing of the IPO and (b) the higher the share price percentage gain after the second day of trading.

H3. The more negative media sentiment for an IPO (a) the lower the underpricing and (b) the lower the share price percentage gain after the second day of trading.

Corporate information

IPOs do not only present an insecure situation for investors due to their fairly anonymousness on the market, but investors also have to evaluate the characteristics of these newly publicly traded firms to attenuate the high levels of uncertainty (Pollock and Rindova, 2003; Pollock *et al.*, 2008). In so doing, investors assess the potential value of these firms and the quality of their services and products, and their likelihood of success and growth in the future. These evaluations are oftentimes based on the analysis of the company profiles, their financial numbers, or assessments by third parties, such as financial analysts (Kraus and Strömsten, 2012). Given that this kind of information is usually exclusive for institutional investors (cf. Pollock and Rindova, 2003; Tong, 2013) and because private investors might not be as familiar with the assessment of financial figures as professional investors (i.e. financial literacy: Pollard, 2016), publicly available media sources are particularly useful for private investors to make sense of the prospective market value of IPOs.

Hence, reading about a crisis of an IPO firm in the media (e.g. the inappropriate interview by Match Group CEO right before its IPO) or learning about a lawsuit of an IPO or about its poor financial performance the past year might lead potential investors to become more careful in investing their money in this company. Therefore, and based on herd-like behavior and the consensus market opinion as explained above, the portrayal of an IPO in the media, including commentaries and assessments of the firm's performance

and business, is likely to affect investors' attitude toward an IPO and their decision to invest in the firm. However, due to the fact that no study so far has investigated corporate information on IPOs and its performance thereafter, we would like to take an open research approach by asking:

RQ2. How does corporate information about IPOs in the news media relate to the flotation performance of IPOs in the first days of trading?

Time of reporting
Research on media coverage and reactions on the stock market imply that there seems to be a dynamic between the recency of news and its effects on stock market prices (e.g. Jang, 2007; Strauß *et al.*, 2016). Various research studies on media coverage and IPOs suggest that the longer the media report on a firm over time, the more information uninformed traders will receive what in turn will lower their uncertainty about the value of an IPO (Jang, 2007; Pollock and Rindova, 2003; Pollock *et al.*, 2008; Tong, 2013). Tong (2013) has investigated media coverage two weeks prior to the day of the IPO and has only found media reputation and recency of news to explain a limited amount of variance in IPO share prices. Jang (2007), on the other hand, has analyzed several time periods (one year up to seven days) before the first day of trading of IPOs and has shown that when media coverage on the stock just prior to the IPO is high, the degree of underpricing increases and the turnovers of the stocks rise. However, Jang's (2007) finding only holds when media coverage on IPOs is high right before the day of the IPO. Regarding a longer period of time (up to one year), Jang has concluded that the higher the media attention, the lower the underpricing of the stock on the first day of trading.

The underlying argument for this decrease in underpricing can be found in psychological research. Heath and Tversky (1991) argue that the more information one receives regarding an activity, the lower the perception of riskiness. In turn, IPO firms that receive considerable media attention in the period before their flotation are more likely to be considered as a safe investment. This might not only increase the perceived legitimacy of the IPO firm by the public but the emission price might get adjusted as well, and is thus more likely to reflect the true value of the company as evaluated by the market. As a result, the share price of the IPO on the flotation day will not vary much from its emission price (cf., lower level of underpricing).

Following this line of thinking, it can be assumed that various periods of media coverage prior to the IPO might affect the performance of IPOs to various extents in the short run. In that sense, it seems that especially the media coverage just prior to the IPO might have a stronger effect on hyping the stock, thereby leading to higher underpricing and a greater share price percentage gain at the end of the second day of trading when compared to coverage aggregated from the week before. However, no study so far has taken the actual media coverage that is published on the day of the IPO itself into account. It is likely though that most of the potential investors, particularly retail investors, pay attention to the news in the morning and on the day of the IPO itself to observe how the flotation is perceived by the consensus market opinion (cf. Davis, 2005). In turn, not only media presentations of the IPO firms in the week prior to the flotation, but also on the day of the IPO itself might affect herd-like trading decisions by the market (cf. Nofsinger, 2005; Prechter, 2001). Thus, due to contradicting and limited research on the recency of news, we pose an open research question:

RQ3. To what extent do the relations between media coverage (media attention, sentiment, corporate information) and (a) the level of underpricing and (b) the share price percentage gain after the second day of trading differ with regard to media coverage on the day of IPO itself vs six days prior?

Data and method

Data

Germany has experienced a tremendous increase in IPOs in the late 1990s and in the beginning of the 2000s, with a maximum of 175 IPOs in 1999 (Statista, 2016). The slow increase of IPOs after the global financial crisis 2007-2009, and therewith rising emission volumes with Covestro as one of the biggest IPOs in Germany since 2007 (Ernst and Young, 2015), substantiate the investigation of the role of media in explaining the flotation performances of IPOs in Germany in recent years. Our objects of analysis are 50 German IPOs that went public from 2011 until the end of December 2015. To be included in the sample, the IPO firm had to be listed on the Frankfurt stock exchange within the period of analysis. Furthermore, at least one German speaking article that dealt with the IPO firm had to be retrievable from the LexisNexis database. A total of 3,644 articles covering all 50 IPOs were eventually analyzed.
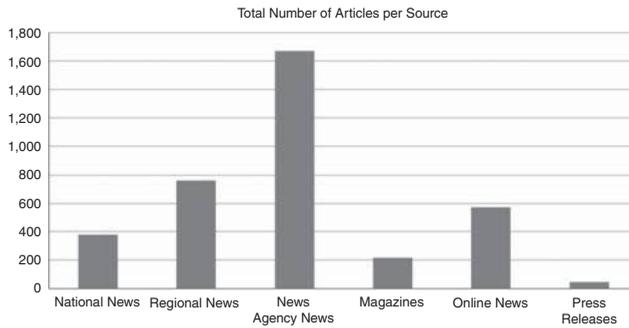
Measurements

Media attention. Media attention was measured by the total number of German speaking articles (Swiss and German media included) that were retrievable for an IPO from the LexisNexis database[1]. The sources for articles were national and regional newspapers, news agency reports, as well as online news, magazines, and selectively some press releases. We retrieved the articles by typing in the company name of each IPO in the search function and by restricting the search for one week prior to the date of the IPO. After retrieving all news articles, two variables were constructed: one variable for media attention measuring the number of articles on the IPO day itself, and one that represented the sum of news articles aggregated from six days prior to the IPO. Figure 1 gives an overview of the overall media attention for each German IPO between 2011 and 2015, including six days prior to the IPO and the day of the IPO itself. Figure 2 shows the distribution of media attention for all IPOs per source.

Media sentiment. Following Tong (2013) and Jang (2007), we decided to manually code news on IPO firms and to identify whether the information related to the German IPO is written in a positive, neutral, or negative tone of voice. Three coders were trained to understand the specific terminology of IPO reporting in the German speaking news media and to code the sentiment of the articles reliably. A pre-test in which 146 articles were coded showed a satisfying Krippendorff's α for sentiment of 0.745. For the analyses, media sentiment was eventually split up in three variables: the total amount of times an article dealing with an IPO was found to be rather positive, neutral, or negative. This resulted in six variables, measuring overall negativity, neutrality, or positivity of media reporting for each IPO, one time aggregated for the media coverage six days prior to the IPO and one time for the day of the IPO itself. Due to collinearity with media attention, neutral sentiment had to be excluded from the subsequent analyses.

Corporate information. Pre-specified categories of corporate information that emerged from reading a few articles and getting familiar with the subject matter were coded in an exploratory coding round of the material. After discussions with the coding team, categories were adjusted or additionally included. The final list of corporate information was also tested in a pre-test. However, given that not all categories were present in the test material, we are only able to report average percent agreements for the inter-coder reliability tests of these items. The final list of corporate information included: date/plans of the IPO (87.67 percent), crisis (99.54 percent), lawsuits (99.54 percent), performance of IPO (84.93 percent), financial performance (89.50 percent), strategy change (89.50 percent), management change (99.09 percent), merger and acquisition (99.09 percent), CEO/management (94.98 percent), product (86.30 percent), new product (96.80 percent), and other (86.76 percent). For the

Figure 1.
Overall media
attention for all IPOs,
including six days
prior to the
IPO and the day
of the IPO itself

Figure 2.
Total number of
articles per source for
all IPOs

Total Number of Articles per Source

Note: $n=3{,}644$

analyses, the 12 variables for corporate information were based on the sum of times each category was coded in the media coverage for each IPO six days prior or on the day of the IPO itself. Due to collinearity with media attention, the categories date/plans of the IPO and performance of IPO had to be removed from the analyses.

IPO performance. Following previous research (e.g. Jang, 2007; Pollock and Rindova, 2003), underpricing was measured by the difference between the emission price[2] of an IPO and its closing price on the first day of trading. Underpricing was calculated as follows:

$$\text{Underpricing} = \frac{\text{Closing price 1st day} - \text{Emission price}}{\text{Emission price}}$$

Hence, the higher the difference between the emission price and the closing price on the first day of trading, the higher the underpricing. The share price percentage gain of the IPO after the second day of trading is the difference between the closing price of the IPO on the second day of trading and the closing price on the first day of trading. The equation used in the analyses reads as the following:

$$\text{Share price percentage gain} = \frac{\text{Closing price 2nd day} - \text{Closing price 1st day}}{\text{Closing price 2nd day}}$$

Control variables. We also included control variables in our analysis, given that certain company characteristics of the IPOs might determine the performance of the flotation and the coverage in the media, respectively. For example, it can be argued that due to their long-year existence, older firms might be more publicly known and newsworthy when compared to younger firms, making the IPO likely to appear more legitimate (cf. Liu *et al.*, 2014). Start-ups or new firms, on the other hand, might need more time to establish themselves on the market and make themselves heard by the media and the financial community. Hence, we controlled for the age of the IPO firms in our analyses by including the year of foundation as stated on the official company websites.

According to Liu *et al.* (2014), the size of companies is another important factor for journalists to cover companies in the media. Given that larger firms are more likely to be covered in the media and thereby probably affecting the flotation performance, we also took the size of the IPO in our analyses into account. The size of the company was measured by

the number of employees employed in the year of the IPO as indicated on the balance sheets or annual reports of the firms (cf. Wibon, 2003).

In addition, we wanted to correct for a measurement of risk. Following Ritter (1984), we took the EBITDA of the IPO firm from the year before the IPO took place, measured in millions of Euros. This information was collected from the annual reports from the IPOs, as provided on their websites. However, not all IPOs reported their EBITDA. Therefore, we looked for similar indicators, such as "EBIT" or "Ergebnis vor Steuern" (result before taxes). The matching indicator per IPO as well as the sources for retrieving these data can be found in the IPO overview, which can be requested from the corresponding author.

Eventually, we also included dummy variables for the industry the IPOs can be allocated to. This has been done based on the Bloomberg sector classifications. Given that there were only few consumer staples and telecommunication services in our selection of IPOs, we consolidated these particular IPOs to the broader categories of consumers and technology, respectively.

Method of analysis
Following Jang (2007), hierarchical OLS regressions were applied to find out how news media variables (media attention, corporate sentiment and corporate information) as well as control variables affected the flotation performance of German IPOs in the first days of trading. To do so, the underpricing or the share price percentage gain after the second day of trading were used as dependent variables, and all media and control variables were added to the OLS models hierarchically in four steps: first, media attention was added to the regression model; second, the corporate sentiment variables (positive, negative) were included; third, the corporate information variables were subjoined; and last, the control variables were entered to construct the full model. Furthermore, to disentangle the recency effects of news media on the performance of IPOs, the OLS regressions with the media variables were conducted one time for the aggregated media variables covering six days prior to the IPO, and once for the variables aggregated for the IPO day itself. Due to various outliers per data set (six days vs day of the IPO itself), not all variables could be included in one model.

Results
Diagnostics and sensitivity analyses
Each time the new variables were entered to the OLS models (step 1 to step 4), OLS diagnostics were performed. Both the dependent variables and independent variables were tested for normality by means of the kernel density estimate, the standardized normal probability plot, the plots of the variables against quantiles of normal distribution, and the augmented component-plus-residual plot. Tables II to V indicate the transformations that were undertaken to obtain the best possible normality scores. Severe outliers were identified by estimating the inter-quartile range (see the notes of Tables II-V for the outliers identified). The variance inflation factors of our models showed acceptable ranges for each model, indicating that the parameter estimates did not suffer from multicollinearity. Moreover, neither problems with heteroscedasticity, nor omitted variable bias could be observed. Table I shows the descriptive statistics of all variables in the sample.

The results of the hierarchical OLS regressions models can be found in Tables II to V. In order to test the formulated hypotheses and answer the research questions, four separate hierarchical OLS regressions were run. First, predicting the IPO underpricing based on news coverage of the day of the IPO (Table II) and, second, based on news coverage of six days prior to the IPO (Table IV). Third, predicting the share price percentage gain after the second day of trading based on news coverage of the day of the IPO (Table III) and fourth, based on news coverage from six days prior to the IPO (Table V).

Variables	Day of the IPO ($n = 49^a$)		Six Days Prior to IPO ($n = 47^b$)	
	Mean	SD	Mean	SD
Underpricing	0.019	0.092	0.022	0.093
Win after 2nd day of trading	−0.009	0.084	0.000	0.045
Media attention	26.429	30.703	49.979	64.909
Corporate sentiment				
Positive sentiment	7.082	11.812	5.213	10.831
Negative sentiment	4.490	6.348	11.340	28.603
Corporate information				
Crisis	0.102	0.510	0.809	3.687
Lawsuits	0.000	0.000	0.043	0.292
Financial performance	1.898	3.618	3.213	5.579
Strategy change	1.592	2.901	2.957	5.676
Management change	0.000	0.000	0.085	0.351
Merger and acquisition	0.041	0.200	0.085	0.282
CEO/management	0.735	1.812	1.894	4.760
Product	2.367	4.137	4.255	7.878
New product	0.102	0.368	0.298	0.883
Other	3.000	7.171	7.064	15.178
Controls				
Year of foundation	1,955.551	98.147	1,953.511	99.720
Number of employees	6,729.367	14,312.83	6,996.851	14,558.73
Returns in year before IPO	77.655	165.137	79.719	168.376
Sector: consumer	0.347	0.481	0.362	0.486
Sector: financials	0.184	0.391	0.191	0.398
Sector: technology	0.245	0.434	0.234	0.428
Sector: materials	0.122	0.331	0.106	0.312
Sector: industrials	0.061	0.242	0.064	0.247
Sector: utilities	0.041	0.200	0.043	0.204

Table I.
Descriptives of
all variables

Notes: [a]Feike excluded because no articles available on the day of the IPO; [b]China BPIC, Roy Ceramics, and Ultrasonic excluded because no articles available six days prior to the IPO

Media attention
H1 predicted that more media attention for IPOs results in higher underpricing and a higher share price percentage gain of the IPO after the second day of trading. When inspecting Tables II to V, we observe a significant positive relationship of media attention for IPOs on the win after the second day of trading, but merely for media coverage on the day of the IPO itself (see Table III). This relation only becomes significant in the second model of the hierarchical OLS regression models when corporate sentiment is added, but stays significant in the third and full OLS model. In fact, the β coefficient becomes larger when the corporate information and the control variables are added. Although the difference was not significant, the explained variance was highest with the full model. As a result, *H1a* is rejected, but *H1b* is accepted with regard to media coverage on the day of the IPO.

Corporate sentiment
The second hypothesis assumed a positive relationship of positive corporate sentiment for an IPO and the underpricing of the IPO and the share price percentage gain after the second day of trading. When taking a look at Tables II to IV, only one significant relationship can be found for positive sentiment and the underpricing of IPOs for media coverage six days

Variables	Model 1		Model 2		Model 3		Model 4	
	B (SE)	β	B (SE)	β	B (SE)	β	B (SE)	β
Media attention (log)	0.011 (0.01)	0.218	0.019 (0.02)	0.372	0.029 (0.02)	0.579	0.020 (0.02)	0.411
Positive sentiment (sqrt)			0.005 (0.01)	0.149	0.014 (0.01)	0.447	0.015 (0.01)	0.489
Negative sentiment (sqrt)			−0.015 (0.01)	−0.378	−0.009 (0.01)	−0.227	−0.008 (0.01)	−0.207
Crisis (sqrt)					0.050 (0.03)	0.275	0.067 (0.05)	0.368
Financial performance (sqrt)					0.009 (0.01)	0.149	0.013 (0.02)	0.223
Strategy change (sqrt)					−0.006 (0.01)	−0.099	−0.003 (0.01)	−0.050
Merger and acquisition (sqrt)					−0.002 (0.05)	−0.007	0.003 (0.06)	0.011
CEO/management (sqrt)					−0.023 (0.02)	−0.305	−0.025 (0.02)	−0.339
Product (sqrt)					−0.009 (0.01)	−0.171	−0.008 (0.01)	−0.141
New product (sqrt)					0.017 (0.03)	0.091	0.013 (0.04)	0.069
Other (sqrt)					−0.022* (0.01)	−0.558	−0.022 (0.01)	−0.569
Year of foundation (cubic)							−0.000 (0.00)	−0.112
Number of employees (log)							−0.002 (0.01)	−0.072
Returns in Year before IPO (log)							0.004 (0.01)	0.149
Sector: consumer							−0.016 (0.05	−0.128
Sector: financials							−0.018 (0.05)	−0.121
Sector: technology							−0.035 (0.05)	−0.265
Sector: materials							−0.037 (0.05)	−0.211
Sector: industrials							−0.028 (0.06)	−0.118
Sector: utilities							0.000 (.)	0
Constant	−0.015 (0.21)		−0.024 (0.03)		−0.048 (0.03)		0.045 (0.12)	
R^2	0.047		0.147		0.384		0.429	
ΔR^2			0.100		0.237		0.045	
BIC	−129.2		−126.7		−111.2		−87.8	
n	47		47		47		47	

Notes: Standard errors in parentheses; sector variables were represented as dummy variables, outliers for Models 1-4: Lotto, windeln.de; lawsuits and change in management as corporate information variables were excluded because of absence in the media coverage on the day of the IPOs. *$p < 0.05$

Table II.
OLS results for
variables of news
coverage of the day of
the IPO predicting
underpricing

prior to the IPO. However, contrary to the expectations, this relationship is negative and does not stay significant when corporate information and control variables are added to the models (Table IV). Hence, *H2a* and *H2b* are rejected.

H3 suggested negative corporate sentiment to be negatively related to underpricing and share price percentage gain after the second day of trading. When reviewing Tables II-V we find a negative relationship for negative corporate sentiment and the share price percentage gain after the second day of trading, but only when considering media coverage on the day of the IPO. This relationship persists to stay significant when adding corporate information and all control variables. Although the explained variance of the share price percentage gain is highest in the full model, the β coefficients are lower in the model in which all variables are added. Moreover, we find a negative relationship of negative corporate sentiment on the share price percentage gain after the second day of trading when taking media coverage six days prior to the IPO into consideration (see Table V). Yet, this negative relationship can only be observed when all corporate information and control variables are entered in the OLS regression model. Furthermore, this full model also evinces a higher explained variance of the share price percentage gain after the second day of trading. Thus, *H3a* is rejected, whereas *H3b* is accepted.

Corporate information
In *RQ2*, it was asked whether the presence of corporate information in the news is related to the performance of IPOs in the first days of trading. First, it has to be pointed out that there

Variables	Model 1 B (SE)	β	Model 2 B (SE)	β	Model 3 B (SE)	β	Model 4 B (SE)	β
Media attention (log)	0.002 (0.00)	0.082	0.020* (0.01)	0.717	0.026** (0.01)	0.943	0.027* (0.01)	0.989
Positive sentiment (sqrt)			−0.004 (0.00)	−0.225	−0.002 (0.00)	−0.107	−0.002 (0.01)	−0.115
Negative sentiment (sqrt)			−0.013** (0.00)	−0.669	−0.013** (0.00)	−0.648	−0.013* (0.01)	−0.636
Crisis (sqrt)					0.023 (0.02)	0.250	0.025 (0.03)	0.270
Financial performance					−0.002 (0.00)	−0.089	−0.005 (0.01)	−0.254
Strategy change (sqrt)					0.004 (0.01)	0.122	0.008 (0.01)	0.230
Merger and acquisition					0.007 (0.02)	0.044	0.009 (0.03)	0.063
CEO/management (sqrt)					−0.006 (0.01)	−0.161	−0.004 (0.01)	−0.111
Product (sqrt)					−0.011 (0.01)	−0.379	−0.011 (0.01)	−0.379
New product					−0.039* (0.02)	−0.323	−0.050* (0.02)	−0.410
Other (sqrt)					−0.004 (0.01)	−0.164	−0.007 (0.01)	−0.279
Year of foundation (cubic)							0.000 (0.00)	0.082
Number of employees (log)							0.001 (0.00)	0.053
Returns in year before IPO							0.000 (0.00)	0.174
Sector: consumer							0.017 (0.02)	0.271
Sector: financials							0.010 (0.02)	0.138
Sector: technology							0.027 (0.02)	0.394
Sector: materials							0.020 (0.03)	0.204
Sector: industrials							0.000 (.)	0
Sector: utilities							−0.002 (0.03)	−0.017
Constant	−0.004 (0.01)		−0.025 (0.01)		−0.030* (0.01)		−0.075 (0.06)	
R^2	0.007		0.200		0.423		0.489	
ΔR^2			0.194*		0.223		0.066	
BIC	−185.0		−187.3		−171.7		−150.4	
n	46		46		46		46	

Table III.
OLS results for variables of news coverage of the day of the IPO predicting share price percentage gain after second day of trading

Notes: Standard errors in parentheses; sector variables were represented as dummy variables; outliers for Models 1-4: Roy Ceramics, Zalando, Osram; Lawsuits and change in management as corporate information variables were excluded because of absence in the media coverage on the day of the IPOs. *$p < 0.05$; **$p < 0.01$

are no significant relationships for the topics: crisis, financial performance, lawsuits, merger and acquisition, management change or CEO/management and the performance of IPOs – neither on the underpricing, nor on the share price percentage gain after the second day of trading. Thus, it can be concluded that when media addresses one of these topics related to the IPOs, it does not seem to affect the flotation performance of IPOs notably.

However, we find significant relationships for the topics new product, product, strategy change, and others. More specifically, we identify the topic dealing with new products to negatively predict underpricing when considering media coverage six days prior to the IPO (Table IV). Furthermore, it became evident that the share price percentage gain after the second day of trading is predicted by news media covering new products of IPOs firms on the day of the IPO itself (Table III). In both cases, the relationships stay significant when the control variables are added, also leading to a higher explained variance of the share price percentage gain after the second day of trading. What is more, the β coefficients increase for the full OLS models. Concluding, having media reporting on products that the IPO firm is going to introduce or develop appears to be negatively related to the flotation performance of IPOs.

In a similar vein, media coverage dealing with products of the IPO firm seems to be negatively related to the share price percentage gain after the second day of trading (Table V). However, this relationship only persists for media coverage from six days prior

Variables	Model 1 B (SE)	β	Model 2 B (SE)	β	Model 3 B (SE)	β	Model 4 B (SE)	β
Media attention (log)	0.005 (0.01)	0.106	0.009 (0.01)	0.177	−0.004 (0.01)	−0.094	−0.008 (0.02)	−0.169
Positive sentiment (sqrt)			−0.007 (0.01)	−0.179	−0.028* (0.01)	−0.807	−0.024 (0.01)	−0.682
Negative sentiment (sqrt)			0.001 (0.00)	0.069	−0.013 (0.01)	−0.672	−0.012 (0.01)	−0.628
Crisis (sqrt)					−0.014 (0.02)	−0.224	−0.003 (0.03)	−0.046
Lawsuits					−0.023 (0.04)	−0.128	−0.005 (0.04)	−0.025
Financial Performance (sqrt)					0.009 (0.01)	0.206	0.007 (0.02)	0.150
Strategy change (sqrt)					0.026 (0.01)	0.595	0.030* (0.01)	0.687
Management Change (sqrt)					0.071 (0.06)	0.381	0.058 (0.07)	0.309
Merger and acquisition					0.003 (0.05)	0.018	0.009 (0.08)	0.050
CEO/management (sqrt)					0.023 (0.02)	0.528	0.016 (0.02)	0.353
Product (sqrt)					0.006 (0.01)	0.166	0.009 (0.01)	0.246
New product (sqrt)					−0.072* (0.03)	−0.693	−0.074* (0.03)	−0.710
Other (sqrt)					0.018 (0.01)	0.738	0.013 (0.01)	0.534
Year of foundation (cubic)							−0.000 (0.00)	−0.114
Number of employees (log)							0.003 (0.01)	0.105
Returns in year before IPO (log)							0.004 (0.01)	0.231
Sector: consumer							−0.020 (0.05)	−0.177
Sector: financials							−0.033 (0.05)	−0.235
Sector: technology							−0.035 (0.05)	−0.276
Sector: materials							−0.073 (0.05)	−0.428
Sector: industrials							−0.049 (0.08)	−0.226
Sector: utilities							0.000 (.)	0
Constant	−0.001 (0.03)		−0.004 (0.03)		0.019 (0.03)		0.080 (0.10)	
R^2	0.011		0.034		0.360		0.498	
BIC	−123.3		−116.7		−98.3		−82.5	
n	45		45		44		44	

Notes: Standard errors in parentheses; sector variables were represented as dummy variables; outliers for Models 1-2: Lotto, windeln.de; outliers for Models 3-4: Lotto, windeln.de, GSW Immobilien; ΔR^2 was not calculated due to different n of models. *$p < 0.05$

Table IV.
OLS results for
variables of news
coverage of six
days prior to the
IPO predicting
underpricing

to the IPO and only becomes apparent when all control variables are included. Although the explained variance of the share price percentage gain after the second day of trading is higher in the full model, the β coefficient is smaller when compared to the relationship that has been found for media coverage dealing with new products of the IPOs. Similarly, information coded as "other" in the media coverage on the day of the IPO appears to be negatively related to the underpricing of IPOs (Table II). Taking a look at the actual coding of "other," the information in these news items deals with various topics, among others the reporting on previous cancellations of the IPO dates, information on the market and competitor environment, or opinions from analysts or politicians. However, the relationship found for other corporate information does not prevail when all control variables are added in the full OLS model – although the full model explains more variation of the underpricing of IPOs.

Eventually, there seems to be a positive relationship between corporate information on strategy change in the news media six days prior to the IPO and the underpricing of IPOs (Table IV). In other words, the more the media report on changes in strategy (e.g. expansions, spin-offs, or debt reductions), the higher the closing price of the IPO on the first day of trading compared to its emission price. Although the significant relationship only becomes present after adding the control variables to the model, the β coefficient for strategy change is higher than for information on products or other corporate topics. Similarly, the explained variance of underpricing is also higher when considering the full OLS model.

Variables	Model 1		Model 2		Model 3		Model 4	
	B (SE)	β	B (SE)	β	B (SE)	β	B (SE)	β
Media attention (log)	0.007 (0.00)	0.229	0.014 (0.01)	0.480	0.009 (0.01)	0.360	0.014 (0.01)	0.547
Positive sentiment (sqrt)			0.000 (0.01)	0.012	0.001 (0.01)	0.026	−0.013 (0.01)	−0.451
Negative sentiment (sqrt)			−0.004 (0.00)	−0.354	−0.009 (0.00)	−0.928	−0.010* (0.00)	−1.061
Crisis (sqrt)					−0.012 (0.01)	−0.387	0.001 (0.01)	0.044
Lawsuits					−0.029 (0.02)	−0.326	−0.011 (0.02)	−0.126
Financial performance (sqrt)					0.003 (0.01)	0.098	0.018 (0.01)	0.621
Strategy change (sqrt)					0.005 (0.01)	0.223	0.013 (0.01)	0.563
Management change (sqrt)					0.032 (0.04)	0.348	0.029 (0.04)	0.322
Merger and acquisition					−0.009 (0.03)	−0.102	−0.083 (0.05)	−0.901
CEO/management (sqrt)					0.009 (0.01)	0.335	0.016 (0.01)	0.573
Product (sqrt)					−0.005 (0.01)	−0.201	−0.017* (0.01)	−0.644
New product (sqrt)					−0.013 (0.03)	−0.174	0.020 (0.04)	0.265
Other (sqrt)					0.011 (0.01)	0.806	0.006 (0.01)	0.449
Year of foundation (cubic)							−0.000 (0.00)	−0.158
Number of employees (log)							−0.002 (0.00)	−0.162
Returns in year before IPO							0.000 (0.00)	0.520
Sector: consumer							0.010 (0.02)	0.168
Sector: financials							0.012 (0.02)	0.173
Sector: technology							0.038 (0.02)	0.619
Sector: materials							−0.002 (0.02)	−0.020
Sector: industrials							0.046 (0.04)	0.433
Sector: utilities							0.000 (.)	0
Constant	−0.019 (0.01)		−0.036 (0.02)		−0.030 (0.02)		−0.006(0.05)	
R^2	0.001		0.105		0.217		0.563	
BIC	−178.0		−173.3		−152.1		−145.6	
n	44		44		43		43	

Table V.
OLS results for variables of news coverage of six days prior to the IPO predicting share price percentage gain after second day of trading

Notes: Standard errors in parentheses; sector variables were represented as dummy variables; outliers for Models 1-2: Osram, Zalando, Rocket internet; outliers for Models 3-4: Osram, Zalando, Rocket internet, JJ Auto; ΔR^2 was not calculated due to different n of models. *$p < 0.05$

Recency of news
Finally, in posing *R3* we wanted to find out whether the relations between media coverage (media attention, corporate sentiment and corporate information) and the level of underpricing as well as the share price percentage gain after the second day of trading differ with regard to the recency of news (day of IPO vs six days prior). When comparing Tables II and III (media coverage for the day of the IPO) with Tables IV and V (media coverage six days prior to the IPO), it emerges that there are more significant and stable relationships (cf. adding controls) when examining media coverage on the day of the IPO itself. However, this is only true with regard to the share price percentage gain after the second day of trading and with regard to negative sentiment and new products mentioned in the news media coverage.

Discussion
The objective of this study was to explore the relationship between news media coverage and the performance of IPOs in Germany. In so doing, we have advanced previous research (e.g. Jang, 2007; Pollock *et al.*, 2008) by paying particular attention to media attention, corporate sentiment, corporate information, the recency of news and its impact on IPO performances in the first days of trading. The findings give support for our main assumptions that media coverage on the day of the IPO itself, (negative) corporate sentiment, as well as particular corporate information (i.e. new product information, strategy) seems to be related to the flotation performance of German IPOs.

More specifically, it was found that media attention devoted to IPOs on the day of the IPO itself is positively related with the share price percentage gain after the second day of trading. Hence, the more news media are reporting on IPOs on the day of the IPO, the greater the share price percentage gain of IPOs after the second day of trading. In that sense, the findings support the positive feedback hypothesis by Shiller (2000) as well as the findings by Fang and Peress (2009) and Barber and Odean (2008) on "attention-grabbing" stocks. In other words, increased media attention on certain firms can contribute to the popularity of these stocks among investors, resulting in rising acquisitions of these shares.

Furthermore, while positive sentiment in the news media six days prior to the IPO has only been found to negatively relate to the underpricing of IPOs when no controls are added, it could be shown that negative corporate sentiment in the media on the day of the IPO itself leads to a decrease in the share price percentage gain of the IPOs after the second day of trading when all control variables are taken into account. The relationship between negative corporate sentiment and share price percentage gain has also become evident when looking at news media coverage six days prior to the IPOs and adding controls. Although previous research on media coverage and IPO performance has neither found disproof or evidence for this relationship (e.g. Jang, 2007; Pollock and Rindova, 2003; Pollock *et al.*, 2008), the findings of this study directly relate to second-level agenda-setting theory. In that sense, the results give support for the notion that negative media representations of IPOs get reflected in public opinion and evaluations of firms in the short run (cf. Carroll and McCombs, 2003), that they trigger investors to buy less shares of the IPOs or even to sell acquired shares of IPOs in the first days of trading.

In addition, this study has advanced existent work by shedding light on the relevance of corporate information on the performance of IPOs in the first days of trading. One of the main findings of this study is that primarily the reporting on new products in the news media, both on the day of the IPO and six days prior, is negatively related to the flotation performance of IPOs (both underpricing and share price percentage gain after the second day of trading). There are two explanations for this finding. First, the negative underpricing of the IPO share price could be explained by the efficient market hypothesis (Fama, 1965). Hence, when the news media are talking about new products of IPO firms six days prior to the flotation, investors can evaluate whether the emission price of an IPO does indeed reflect its potential stock value when taking the new product introduction into account. Thus, the market might demand an adjustment of the emission prices, which would in turn lead to less underpricing.

Second, the decreasing share price percentage gain after the second day of trading might be related to the sector the German IPOs belong. In total, 30 out of 50 IPOs can be allocated to the technology (12) or consumer sector (18). According to Wibon (2003), these sectors are subject to the pressure of a rapid changing technological and consumer environment. In that sense, news media reporting on new products by these IPOs might have aroused some skepticism among investors. It is likely that the investors might have not believed that the IPOs were able to outperform these highly competitive markets by introducing new products.

Another contribution of this study relates to the importance of recency of news coverage in explaining flotation performance of IPOs. To investigate in this, we distinguished between media coverage on the day of the IPO itself and coverage six days prior to the IPO. The results indicate that media coverage on the day of the IPO seems to display more significant and more stable relationships with the flotation performance of IPOs than media coverage aggregated from six days prior to the IPO. However, this only holds with regard to negative sentiment and new products mentioned in the news media and when looking at the share price percentage gain after the second day of trading. Arguing from a psychological perspective, this finding is less surprising as it has been found that increasing information

on activities lowers the perception of riskiness (Heath and Tversky, 1991). Hence, media coverage six days prior to the IPO might have less influence on the performance of IPOs because the information might have already gotten integrated in an adjusted emission price. On the other hand, media coverage on the day of the IPO itself might have caused investors to perceive the situation more risky and insecure, particularly when negative sentiment is expressed in the coverage. Concluding, negative coverage on the day of the IPO is likely to result in a downward effect on the share prices of the IPO after the second day of trading.

At this point, it has to be noted that there were only few significant relationships discovered for news media coverage and the flotation performance of German IPOs overall. Three reasons can be considered for this. First, firms that go public in Germany are subject to publicity restrictions such as quiet periods (Deutsche Börse AG, 2006), which are also binding in other stock exchange contexts such as the USA (Investopedia, 2017). Thus, it is likely that German IPOs have not distributed much relevant corporate information in the days prior to the IPO. Second, first-hand information (e.g. road show presentations) might contain more insightful information for the vast amount of professional investors when making trading decisions than publicly available news, which is the primary source for private investors. Third, an increase in media coverage about an IPO might indicate professional investors that this firm is likely to be overvalued (cf. Pollock *et al.*, 2008). In that sense, instead of jumping on this hype and following the "herd" (Davis, 2005; Oberlechner and Hocking, 2004), professional investors might renounce to invest their money in a stock, which is likely to lose value in the short-run again. This sort of investment restraint might cancel out the effect of news media coverage on IPO flotation performance, being reflected in low underpricing or no statistical significant relationships as found in this study after all.

In this regard, the limitations of this study need to be considered in more detail. Most notably is the limited amount of IPOs investigated in this study. Although having focused on a period of five years, only 50 eligible IPOs in Germany were identified in this research project. This, of course, restricts generalizations, particularly when considering the 14 predictor variables and six dummy variable that were included in the full OLS models. Furthermore, it needs to be noted that the German IPO market that was studied here does not only have a smaller market capitalization than, for example, the US market, but the media landscape of German speaking news media (cf. democratic corporatist model; Hallin and Mancini, 2004) challenges comparisons with other countries as well.

In addition, the decision to only code media coverage six days prior and up to the day of the IPO itself only allows limited conclusions about the long-term effects of media coverage on IPO performances. Hopefully follow-up research can allocate resources that allow analyzing media coverage from longer pre-IPO periods or IPOs from diverse stock exchanges, also controlling for country differences. In fact, scrutinizing the findings from this study in other stock market environments (e.g. London Stock Exchange, Euronext or Japan Exchange) could allow to drawing comparisons across countries and maybe even generalizations for certain markets (e.g. European market).

Furthermore, and building up on this study, future research might even take a turn toward more qualitative research, such as observational studies or interview studies with institutional investors, investor relations, and IPO executives. Related research could put a stronger focus on investigating the content of internal information and information distributed among the IPO management, investor relations, and institutional investors (e.g. roadshows, personal contacts). In this way, follow-up studies could not only provide more academic insights into the complex interrelationship between news media and stock market ratings, but could also inform practitioners on how to better manage unique market events such as IPOs.

In this regard, this study has four take-away points for investor relations and financial communication professionals: first, it is important to manage media representations of IPO firms before and on the day of the IPO itself: it is likely that the more media attention

an IPO firm generates on the day when it goes public, the better the share price percentage gain on the second day of trading. In this vein, communication professionals should manage media relations well and secure a broad but fair reporting of IPOs in the news media before and on the day of the flotation. Second, try to limit negative media coverage in the week of the IPO or on the day of the IPO itself: the findings imply that there is a negative relationship between negative media coverage of IPOs and the flotation performance of IPOs. Therefore, financial communication professionals should try to achieve a positive or neutral portrayal of the IPO firm in the news media, by avoiding the emergence of crises and scandals and preventing the IPO of being associated with negativity. Furthermore, communication professionals are highly discouraged to communicate unrealistic expectations of IPOs in the pre-flotation period in order to avoid disappointments on the market and thus negative news media coverage. Third, be aware when communicating about new products or products of the firm in general during the IPO period: the analyses of this study imply that communication about new products or products of IPO firms during the IPO period be negatively related to the flotation performance. Fourth, and instead, focus on communicating about new strategies: talking about how the IPO is used for a new strategic orientation of the firm or what the real purpose of the IPO is might be a good way to boost the IPO performance of the firms through professional strategic communication.

Notes

1. A list of the news media sources retrieved from LexisNexis can be found here (by clicking on the information icon which appears when selecting "All German News"): http://academic.lexisnexis.nl. Few additional sources occured in the retrieved articles that are not yet listed on LexisNexis.

2. The emission price as well as the correct date of the IPO were mainly retrieved from deutsche-boerse. com. Few emission prices and dates had to be collected from finanzen.net, boerse.de, handelsblatt.com, boerse.ard.de, or boerse-frankfurt. In one case the emission price was retrieved from a press release from the IPO itself (kiongroup.com). The closing prices were retrieved from Google Finance. In two cases, the closing price had to be collected from finanzen.net and boerse.de. The overview of all sources of information can be requested from the corresponding author.

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